

Military

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Electronics®

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Counterfeit electronics
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NextGen software applications promise a bright future for electronic flight bags.

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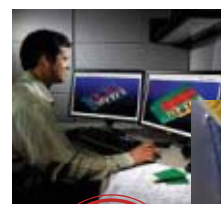
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Designers of electronic flight bags for commercial and business aviation have had a tough run during recent economic woes, as airlines and other aircraft operators have cut back spending due to the recession. Business aviation was hit hard as many companies cut back on private aircraft to save money during the fiscal crisis. This trickles down to those who design cockpit avionics equipment such as electronic flight bags. **Page 13**

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Revenge of COTS procurement: counterfeit parts



By **JOHN KELLER**
EDITOR IN CHIEF

A decade and a half after military commercial off-the-shelf (COTS) procurement burst onto the scene in a big way, the scourge of high tech—counterfeit electronic parts—is still with us, but industry finally seems to be getting off the dime to do something about it.

Don't get your hopes up too much, though; counterfeit parts still represent a big problem, and one that most likely will be with us for the foreseeable future. One semiconductor aftermarket supplier describes U.S. defense prime contractors learning of the threats of counterfeit parts as "a deer in the headlights."

Certainly, there is a long way to go before the semiconductor industry gets control of counterfeit parts, yet the industry finally seems to be waking up to the threat. Read more about it in this issue's report entitled, "Industry and government prepare counter-attacks against electronic parts counterfeiting."

One of the most encouraging developments is the online Electronics Authorized Source Directory (ASD) at www.authorized-components.com, which enables users to look up parts by manufacturer and region to come up with lists of authorized electronics parts sources in their areas. The Electronics ASD is a product of the Anticounterfeiting Task Force, set up by the SEMI international semiconductor industry association in San Jose, Calif., and the Semiconductor Industry Association (SIA), also in San Jose, Calif.

The task force also includes semiconductor companies, such as Intel, AMD, Analog Devices, Texas Instruments, Xilinx, Rochester Electronics, Intersil Corp., Atmel, Fairchild Semiconductor, Freescale Semiconductor, International Rectifier, and others.

This online directory confronts a problem facing designers of mission- and life-critical electronic systems that few want to talk

about: it's hard to tell which electronic parts are authorized, and which are not. Parts not authorized for sale pose a high risk of being counterfeit, and that can mean degraded system performance or system failures.

The easiest way to find electronic parts for systems upgrades or replacements these days is the Internet; it's fast and often inexpensive. It is the Internet, however, that has the highest risk of tripping over counterfeit parts. The Electronics ASD is one way to help parts buyers avoid counterfeiters.

Other steps are being taken. The SEMI organizations last fall published three standards intended to discourage chip counterfeiting: the SEMI T20 Specification for Authentication of Semiconductors and Related Products, SEMI T20.1 Specification for Object Labeling to Authenticate Semiconductors and Related Products in an Open Market, and SEMI T20.2 Guide for Qualifications of Authentication Service Bodies for Detecting and Preventing Counterfeiting of Semiconductors and Related Products. More information is available at www.semi.org.

Industry organizations such as TechAmerica in Arlington, Va.—an amalgamation of the Government Electronics & Information Technology Association, American Electronics Association, Cyber Security Industry Alliance, and Information Technology Association of America—also are formulating bulletins and standards to help the electronics industry avoid counterfeit parts. The U.S. Defense Supply Center Columbus (DSCC) in Columbus, Ohio, is adding personnel to step up the detection and prosecution of parts counterfeiting; some are skeptical about the effectiveness of the programs.

In the end, however, the best solution to the problem of counterfeit parts is the kind of industry awareness that forms only when individual companies take up the issue in an active way. Companies are starting to talk to their customers about the issue; the industry needs more of this. Think about what you can do to spread the word about counterfeit parts. **•**

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RES-32XR3 server shown with optional filter door panels open.

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NEWS

Raytheon to develop next-generation GPS control segment

AURORA, Colo.—The U.S. Air Force awarded Raytheon Co. an \$886 million contract to develop a new element of the Global Positioning System to improve the accuracy of information from GPS satellites.

The contract represents the first two development blocks of the advanced control segment (OCX), which will have a significant impact on GPS capabilities. The OCX will include anti-jam capabilities and improved security, accuracy, and reliability and will be based on a modern service-oriented architecture to integrate government and industry open-system standards.

"We are excited to partner with the Air Force to provide the best-value GPS control system for the future," says Lynn Dugle, president of Raytheon's Intelligence and Information Systems business. "Raytheon's broad experience in delivering satellite-to-ground, command-and-control systems will ensure that our nation's military and civil GPS users worldwide are provided new capabilities."

The OCX will dramatically affect GPS

command, control, and mission capabilities and make it easier for the operations team to run the current GPS block II and all future GPS satellites, Raytheon officials say.

The GPS, a satellite-based radio navigation system for the military and the public, comprises three major segments: the user segment, the space segment, and the control segment, which includes a master control station and ground antennas.

"The OCX concept was created to separate the control and space segments," says Bob Canty, GPS vice president and program manager for Raytheon. "Technologies were evolving so rapidly and were so critical to execution that specialized skills were needed. The GPS wing saw the same need for specialized expertise on GPS OCX."

Teammates include The Boeing Company, ITT, Braxton Technologies, Infinity Systems Engineering, and the Jet Propulsion Laboratory. The contract was awarded by the Air Force Space and Missile Systems Center at Los Angeles Air Force Base. ●

VITA report: Aerospace and defense remains one of the few bright spots for the embedded computing industry

By **JOHN KELLER**

FOUNTAIN HILLS, Ariz.—Aerospace and defense applications were among the few bright spots for the VME embedded computing industry in 2009, as many VME military embedded systems vendors posted gains in what was probably the toughest year in the history of the VMEbus industry, says Ray Alderman, executive director of the VITA open standards, open markets trade association in Fountain Hills, Ariz.

Other than aerospace and defense, 2009 saw sales declines ranging from 30 to 70 percent for board-level products in

telecommunications, industrial, and medical embedded computers, Alderman says in his report, "2010 State of the VME Technology Industry."

For 2010, the military embedded systems market should be stable, yet there are concerns, Alderman says. Within the aerospace and defense market for single-board computers and other embedded computing, demand for unmanned aerial vehicles (UAVs) looks very good, as numerous countries with untrustworthy neighbors are buying UAVs to keep track of their borders.

Continued on page 8

IN BRIEF

GeoEye selects Lockheed Martin to build remote sensing satellite system

GeoEye Inc. selected Lockheed Martin Space Systems Co. to build the company's next-generation, high-resolution Earth imaging satellite system known as GeoEye-2. Lockheed Martin has started buying long-lead components for the satellite and the associated command-and-control system. Lockheed Martin's GeoEye-2 will have better resolution than previous GeoEye satellites—IKONOS and GeoEye-1. This will enable the National Geospatial-Intelligence Agency (NGA) to provide geospatial information to intelligence analysts, warfighters, and decision makers. Commercial users will get access to GeoEye-2's map-accurate color imagery. The spacecraft will have a high-resolution ITT camera that has been in development for more than two years.

Boeing Phantom Eye hydrogen-powered UAV begins development

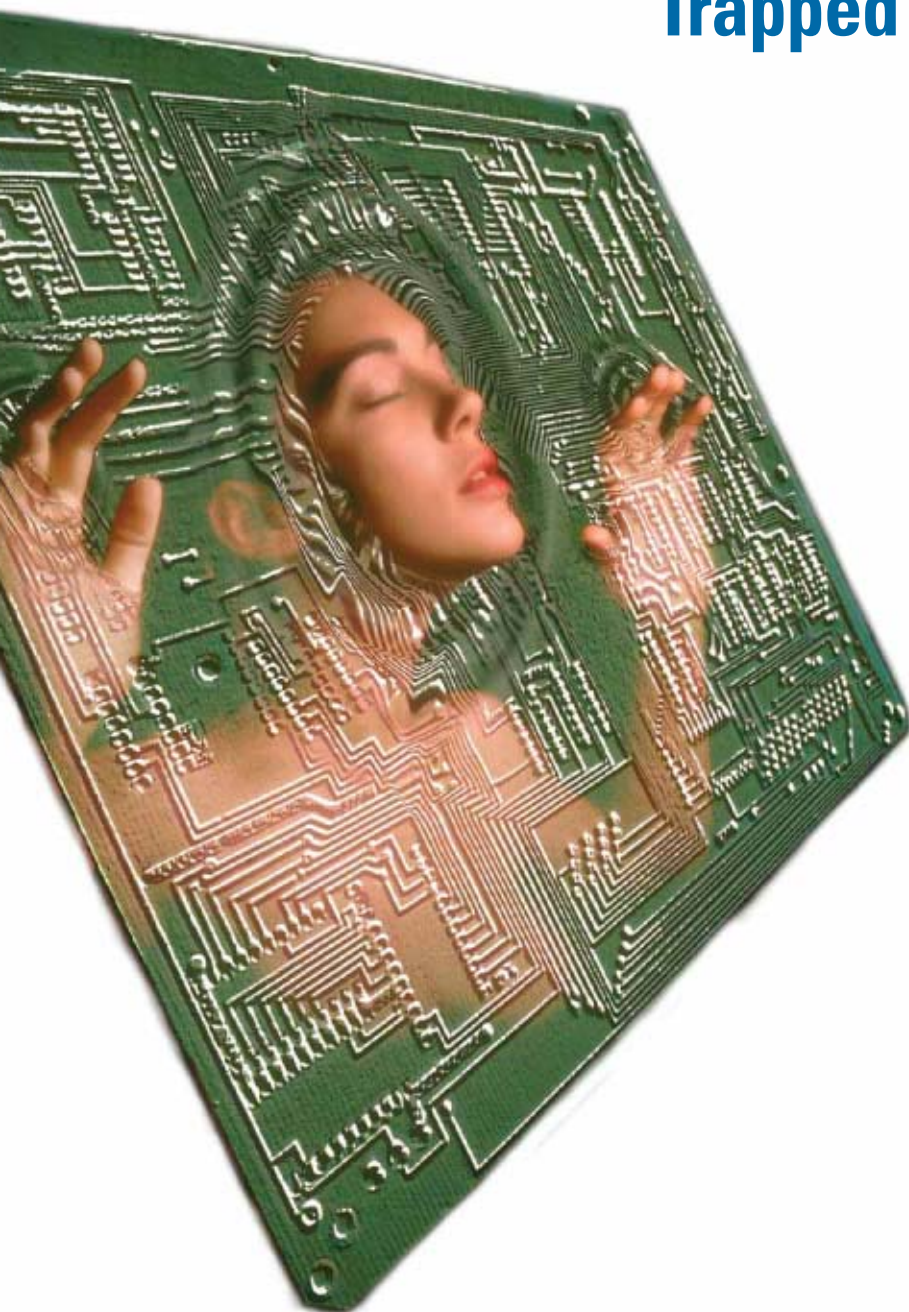
Engineers at the Boeing Co. in St. Louis have begun building the Phantom Eye unmanned, liquid-hydrogen powered, high-altitude, long-endurance (HALE) demonstrator aircraft. "The essence of Phantom Eye is its propulsion system," says Darryl Davis, Boeing Phantom Works president. "After five years of technology development, we are deploying rapid prototyping to bring together an unmanned aerial vehicle [UAV] with a breakthrough liquid-hydrogen propulsion system that will be ready to fly early next year." Phantom Eye's engine, turbo chargers, and engine control system completed an 80-hour test in an altitude chamber on March 1, clearing the way for the propulsion system and UAV to be assembled. The twin-engine Phantom Eye demonstrator will have a 150-foot wingspan and be capable of flying for more than four days at altitudes as high as 65,000 feet while carrying a payload of as much as 450 pounds. Phantom Eye is designed to fly in the stratosphere while performing missions that could include intelligence, reconnaissance, surveillance, and communications.

AAI's advanced boresight equipment selected for U.S. Air Force platforms

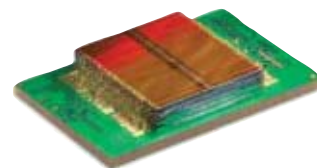
AAI Corp. in Hunt Valley, Md., announced that

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» NEWS

U.S. Army selects Northrop Grumman 100-kilowatt, solid-state laser for field tests

By **JOHN McHALE**

REDONDO BEACH, Calif.—A solid-state laser system from Northrop Grumman Corp. which produces a powerful beam from a continuous-wave, electric laser is joining other speed-of-light weapons for field tests at the Army's High Energy Laser System Test Facility (HELSTF), at White Sands Missile Range, N.M.

BAE Systems has contracted with Northrop Grumman to relocate the Joint High Power Solid State Laser (JHPSSL) Phase 3 system from the company's laser factory in Redondo Beach, Calif., to HELSTF. Field testing is expected to begin this year.

This laser will combine with the beam control and command-and-control systems from another Northrop Grumman-built system, the Tactical High Energy Laser (THEL), to provide the Army with a high-power, solid-state laser test bed experiment (SSLTE), Northrop Grumman officials say.

The SSLTE will help evaluate a 100-kilowatt, solid-state laser, and will be the basis for directing future development of solid-state lasers for weapons.

"Solid-state lasers have achieved militarily useful power levels and packaging densities," says Dan Wildt, vice president of the Space and Directed Energy Systems

segment of the Northrop Grumman Aerospace Systems sector, which has demonstrated lasers at HELSTF for missiles, helicopters, drones, rockets, artillery, mortar rounds, and submunitions.

BAE Systems, which has overall responsibility for the SSLTE systems engineering, will handle relocating the JHPSSL Phase 3 device and the THEL facility refurbishment. BAE Systems is also developing a modular and transportable enclosure to house the JHPSSL device and its control room at the site.

Under the JHPSSL program, Northrop Grumman became reached the 100-kilowatt power level threshold for a solid-state laser. The achievement also included turn-on time of less than one second and continuous operating time of greater than five minutes, with very good efficiency and beam quality.

The JHPSSL program is funded by the Office of the Assistant Secretary of the Army for Acquisition, Logistics, and Technology; Office of the Secretary of Defense—High Energy Laser Joint Technology Office, Albuquerque, N.M.; Air Force Research Laboratory, Kirtland Air Force Base, N.M.; and the Office of Naval Research, Arlington, Va. Responsibility for program execution is assigned to USASMD/ARSTRAT in Huntsville, Ala.

Northrop Grumman designed and built the Mid-Infrared Advanced Chemical Laser (MIRACL) for the U.S. Navy, which was a megawatt-class, continuous-wave chemical laser. The company also developed the first standalone, fully integrated laser weapon system demonstrator, the THEL test bed, which was a joint effort by the Army and Israel's Ministry of Defense to engage short-range Katyusha 1 rockets.

MIRACL and THEL were high-power lasers based at HELSTF within the grounds of White Sands Missile Range. At HELSTF, the Army tests high-energy laser technologies and weapon systems for propagation, lethality, survivability and dynamic engagements. HELSTF has access to the 3,200 square miles of restricted land area and 7,000 square miles of restricted airspace at White Sands to conduct tests. ●

VITA report from page 6

Meanwhile, telecommunications will have the most problems this year, and may even post declines in 2010; industrial embedded computer sales may improve, although this segment is terribly fragmented; and the medical equipment market is still unsure about the effects of health care reforms, Alderman says.

In industrial computing, the major market driver in 2010 is likely to be smart-grid utility development, as well as air traffic control systems.

In the VME embedded computer industry overall, 2010 will be a year of stabilization, not growth—including in aerospace and defense applications, Alderman says. Mergers and acquisitions may heat up again in 2010. In all segments, growth will be spotty and unevenly distributed.

Other factors of influence for the embedded computing industry in 2010 include the transition from copper to optical connectors, the business transition from boards to systems, the transition from DSP chips to DSP cores in field-programmable gate arrays, and the transition from general-purpose processors to digital signal processors, Alderman says.

For more information, visit VITA online at www.vita.com. ●



This artist's rendering depicts a Northrop Grumman Joint High Power Solid State Laser (JHPSSL) taking out an incoming missile.

» IN BRIEF

its advanced boresight equipment, or ABE test set, will provide alignment support for the U.S. Air Force HH-60 Pave Hawk helicopter and CV-22 Osprey tiltrotor aircraft. The awards are worth more than \$1.5 million. ABE is a gyro-stabilized, electro-optical, angular measurement system designed to align aircraft subsystems. AAI will design, develop, and deliver adapters, platform-specific firmware called a Personality Module, training, and manuals for the HH-60 Pave Hawk, as well as an ABE Model 310A core alignment system. These will be provided to the Corpus Christi Army Depot in Texas. In addition, AAI will deliver one common ABE Model 310A multiplatform boresight test set for the CV-22 Osprey to Naval Air Systems Command at Joint Base McGuire-Dix-Lakehurst, formerly Naval Air Engineering Station Lakehurst, in New Jersey. Naval Air Systems Command at Joint Base McGuire-Dix-Lakehurst previously procured ABE for boresight-

ing the AH-1W Super Cobra helicopter gunship, MH-60R Seahawk utility helicopter, AV-8B Harrier II jump jet, and the AH-1Z Viper attack helicopter.

Rockwell Collins conducts testing for JTRS GMR

Rockwell Collins conducted UHF SATCOM and HF waveform Functional Qualification Testing (FQT) on the Joint Tactical Radio System (JTRS) vehicular ground mobile radios (GMR). This testing is conducted to ensure that the Software Communications Architecture (SCA)-compliant waveforms meet all allocated JTRS requirements. FQT reasonably simulates the production environment. FQT verifies that the UHF SATCOM and HF waveforms will provide expected operational waveform functionality before GMR systems are fielded. The waveforms can then be used to support the Production Qualification Testing phase of the GMR program. Like all JTRS Operational Requirement Document waveforms in the 2 MHz to 2 GHz fre-

quency range, the UHF SATCOM and HF waveforms can run in any of the GMR system's four re-programmable universal transceivers.

Harris to provide HF radio systems for MRAP Vehicles

Harris Corp. in Rochester, N.Y., received an order worth \$78 million to provide additional Falcon II AN/VRC-104 high-frequency, tactical radio systems for U.S. Department of Defense (DOD) Mine Resistant Ambush Protected All-Terrain Vehicles (M-ATVs). This order was placed by the U.S. Marine Corps Systems Command on behalf of the DOD's Joint MRAP program. The AN/VRC-104 is a vehicular transceiver/amplifier that includes the AN/PRC-150, a Type-1, high-frequency manpack radio. Harris HF radios are in widespread use by all branches of the DOD and allies around the world, Harris officials say. The Falcon family of software-defined, tactical radio systems encompasses manpack, handheld, and vehicular applications. Falcon

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» **NEWS**

DARPA launches RATS program for advanced speech-recognition algorithms in noisy conditions

By **JOHN KELLER**

ARLINGTON, Va.—Scientists at the U.S. Defense Advanced Research Projects Agency (DARPA) in Arlington, Va., are launching a program to develop speech transcription, translation, and speech signal processing technologies that function effectively in noisy places to support intelligence gathering.

DARPA issued a broad agency in February (solicitation number DARPA-BAA-10-34) for a human language technology research and development program called Robust Automatic Transcription of Speech (RATS) to determine speech activity, identify speakers and languages, and spot key words in extremely noisy field conditions.

DARPA wants innovative approaches that enable revolutionary advances in science, devices, or systems able to gather intelligence from speech received from weak and/or noisy communications channels. RATS test and training data will be collected under both controlled and uncontrolled field conditions.

Existing transcription and translation and speech signal processing technologies are insufficient for working with noisy or degraded speech signals that are of importance to current and future U.S. Department of Defense (DOD) operations, DARPA officials explain.

Since no technological solution exists today to analyze this kind of noisy and distorted speech, operational units must

allocate significant human resources for this task. Even so, operators frequently search blindly over thousands of possible channels at any given moment.

For this project, DARPA experts want to develop algorithms for speech detection, language detection, speaker identification, and key word spotting.

Companies interested in participating in the RATS program should respond no later than 29 July 2010. For questions or concerns, contact DARPA's Joseph Olive by e-mail at DARPA-BAA-10-34@darpa.mil or by fax at 703-807-4949.

More information is online at https://www.fbo.gov/index?s=opportunity&mode=form&id=484d5c77373310d7745963cf27c40cf7&tab=core&_cview=0. ●

F-35 JSF and FedEx experts keynote 2010 Military & Aerospace Electronics Forum and Avionics USA

By **JOHN McHALE**

SAN DIEGO—Eric George, director of mission systems and software for the F-35 Joint Strike Fighter program at Lockheed Martin in Fort Worth, Texas, and Steve Vail, senior advisor for Global Air Traffic Operations at FedEx will deliver the keynote addresses at the 2010 Military &

Aerospace Electronics Forum and Avionics USA conferences and exhibitions to be held June 3–4, 2010 at the San Diego Convention Center in San Diego.

The two conferences—produced by PennWell's Aerospace & Defense Group—are co-located with a shared exhibit floor. To register for the event, go to

<https://www.pennwellregistration.com/online/LoginServlet?confId=362>.

The conference Web sites are www.milaeroforum.com and www.avionics-usa.com.

For worldwide exhibit sales, contact JoAnn Pellegrini at 650-941-3438 or JoAnnP@pennwell.com. ●

» IN BRIEF

III is the next-generation family of radios supporting the U.S. military's Joint Tactical Radio System requirements.

Sypris provides components for F-35 Joint Strike Fighter

Sypris Electronics LLC will provide electronic assemblies for the F-35 Joint Strike Fighter program. Technology provided includes assemblies for the communications, navigation, and identification (CNI) Avionics Interface Controller (two per aircraft) and CNI Processor (five per aircraft), each of which serve as communications modules in the

avionics suite. The Northrop Grumman avionics system is built on software-defined radio technology that provides F-35 pilots with the consolidated capabilities of more than 40 avionics subsystems.

Boeing transfers International Space Station sections to NASA

Boeing officially turned over the U.S. on-orbit segment of the International Space Station (ISS) to NASA with the signing of government form DD-250 at the conclusion of an Acceptance Review Board meeting in Houston. The DD-250 is equivalent to a final bill of sale that formally transfers ownership. Through the review board, NASA and Boeing verified the delivery, assembly, integra-

tion and activation of all hardware and software required by contract. Thousands of components make up the segment's core systems, including thermal control, environmental control, guidance and navigation, communication and tracking, electrical power distribution, command and control, structure and mechanisms, and robotics. The U.S. segment interfaces with all the ISS international partner elements. It encompasses the truss segments, including the four solar arrays, and several pressurized modules, which consist of: Unity and Harmony, connecting nodes 1 and 2; the Destiny laboratory module; the Quest airlock; pressurized mating adapters; the Zarya storage module, built in cooperation with the Russian Federal Space Agency; and more than 2 million lines of software code to operate all the components. ●

DARPA eyes foliage-penetrating radar signal processing workstation to detect infantry moving in forests

By **JOHN KELLER**

ARLINGTON, Va.—Radar signal processing experts at the U.S. Defense Advanced Research Projects Agency (DARPA) in Arlington, Va., are asking industry to develop a data-processing workstation to help pinpoint concentrations of foot soldiers moving in thick forests and other dense foliage.

The idea is to process radar signals from a foliage-penetrating (FOPEN) radar mounted to manned and unmanned helicopters to filter out radar clutter like animals, wind-blown foliage, and moving water to estimate the position, size, and direction of travel of infantry concentrations moving in foliage.

The program is called Foliage Penetrating Ground Moving Target Indicator Radar Exploitation and Planning (FOPEN-GXP). Its goal is to develop and integrate a set of tools to enhance foliage-penetrating radar data as modules into a FOPEN-GXP system workstation.

DARPA wants to demonstrate the effectiveness of such a workstation with data from the Foliage Penetration Reconnaissance, Surveillance, Tracking, and Engagement Radar (FORESTER) system developed by Syracuse Research Corp. in North Syracuse, N.Y., which is mounted to a Boeing A-160 Hummingbird unmanned aerial vehicle (UAV).

DARPA issued a broad agency announcement (DARPA-BAA-10-07) in late February for the FOPEN-GXP program to develop foliage-penetrating radar signal processing workstations with modules that discriminate between Doppler radar signatures, estimate the state and activities of detected infantry concentrations, plan where to place the radar sensors, and determine radar modes for best results.

DARPA has tested the FORESTER radar on a manned UH-60 Black Hawk helicopter, as well as on an A-160 Hummingbird unmanned helicopter. Last year, DARPA experts tested the FORESTER on an A-160 to detect radar returns from moving humans and animals, ground vehicles, boats, and other clutter and false targets.

Companies interested must respond no later than 23 Aug. 2010. For questions or concerns, contact Mark Luetgten, the DARPA program manager, by e-mail at DARPA-BAA-10-07@darpa.mil, by fax at

703-741-1374, or by post at ATTN: DARPA-BAA-10-07, 3701 North Fairfax Dr., Arlington, VA 22203-1714.

More information is online at <https://www.fbo.gov/spg/ODA/DARPA/CMO/DARPA-BAA-10-07/listing.html>.

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» NEWS

Lockheed Martin, Northrop Grumman to provide computers for Navy CANES shipboard networking program

By **JOHN KELLER**

SAN DIEGO—Northrop Grumman Corp. and Lockheed Martin Corp. will provide the U.S. Navy with shipboard computers for the Consolidated Afloat Networks and Enterprise Services (CANES) program, under terms of contracts awarded in March.

The Northrop Grumman Information Systems segment in Reston, Va., won a \$17.4 million contract, while Lockheed Martin Maritime Systems & Sensors (MS2) Tactical Systems in San Diego won a \$15 million contract to provide the CANES common computing environment (CCE). Selection of one prime contractor to complete limited rate initial production (LRIP) is expected next year.

The CANES program consolidates dozens of the Navy's afloat information systems networks, to reduce infrastructure size and cost, while enhancing reliability and capability. The CANES solution would be deployed across the Navy's 300-plus ships and shore-based sites.

CANES seeks to build a secure shipboard communications network to enable ships at sea to operate together during joint operations. CANES also will consolidate and reduce the number of shipboard networks by using mature cross-domain technologies and a common computing environment infrastructure, which will include cloud computing.

Essentially, CANES and its common computing environment is the latest Navy program to equip its surface warships with modern computer and networking equipment. Unlike similar programs in the past, the CANES program aims to accommodate computer and networking technology as it evolves, and to mitigate computer obsolescence in the fleet.

Navy leaders expect the CANES

program to fall into line with commercial business information technology (IT) trends and move away from the traditional U.S. Defense Department integrated hardware and software stack legacy systems.

The Navy has a long history of unique, closed-system computer architectures going back to the shipboard UYK computers

CANES. Others on the Northrop Grumman team are Atlas Technologies, Beatty and Co. Computing, Juno Technologies, Syzygy Technologies Inc., and Center-Beam Inc.

Northrop Grumman and Lockheed Martin both will do the work on their CANES CCE contracts in San Diego, and



The Navy CANES Common Computing Environment will design a new generation of shipboard computers for surface warships and shore installations.

and airborne AYK computers. These systems—although they often were adequate for their assigned tasks—fell hopelessly behind the computing state of the art, and were difficult to upgrade.

The Lockheed Martin team includes General Dynamics, ViaSat Inc., Harris Corp., and American Systems Corp., as well as several small technology businesses. IBM Global Business Services in Bethesda, Md., is Northrop Grumman's major technology and services partner on

should be finished by April 2011. Options could extend these jobs to September 2014, and increase their total contract awards to \$775.3 million and \$936.9 million, respectively. Awarding the contracts were officials of the Space and Naval Warfare System Command in San Diego.

For more information, visit Northrop Grumman Information Systems online at www.is.northropgrumman.com, or Lockheed Martin MS2 at www.lockheedmartin.com/ms2. ●

» SPECIAL REPORT

Future looks brighter for electronic flight bags (EFBs)

By **JOHN McHALE**

Electronic flight bag (EFB) designers are hopeful as demand for commercial avionics is starting to turn upward and airlines are becoming more receptive to EFB technology. Meanwhile the military is seen as a long-term growth opportunity for EFB devices, albeit those that are more secure and rugged.


Designers of electronic flight bags (EFBs) for commercial and business aviation have had a tough run during the world's recent economic woes, as airlines and other aircraft operators have cut back spending due to the recession.

Business aviation was especially hit hard as many companies cut back on their private aircraft to save money during the fiscal crisis. This of course trickles down to those who design cockpit avionics equipment such as electronic flight bags (EFBs).

Despite their economic woes, EFB designers continue to add capability to their devices. EFBs were basically created to eliminate paper in the cockpit but today offer more capabilities such as airport moving maps (AMMs), satellite weather updates, electronic charting, and software compatibility with the Federal Aviation Administration (FAA) Next Generation Air Transportation System (NextGen).

The improved capability is also making EFBs more attractive to operators as the commercial avionics market starts to turn around.

"We see encouraging signs with the commercial market," says Bill Ruhl, marketing manager for Astronautics Corporation of America in Milwaukee. "The airlines are getting more interested in EFBs because they are now avionics-quality, installed computers that support NextGen certified software applications rather than devices that just replace paper," Ruhl says.

 The PilotView electronic flight bag is shown installed in a Boeing 737 cockpit.

» SPECIAL REPORT

"Things are starting to improve," says Ken Crowhurst, director of marketing at navAero Inc. in Chicago. "We see an uptick in the U.S. market and in Europe especially."

"We're very encouraged by Europe, which typically lags behind North America" in terms of technology adaptation, Crowhurst says. Many operators in Europe are embracing EFB technology because they see that it works and is cost-efficient, he adds. EFBs are also platform independent and will enable operators to retrofit their existing fleet with NextGen capability more economically, Crowhurst notes.

Airlines are getting over some of their initial reservations regarding EFBs "because they are finding that EFBs reduce pilot workload, simplify flight operations, and provide greater situational awareness," says Michael P. Toothman, director of IMS FlightDeck in Brea, Calif.

"We've right-sized our forecasts since 2009 and are starting to see a slow recovery," says Loring MacKenzie, senior marketing and sales manager at Esterline CMC Electronics in Montreal. "The market has not gone up exponentially," but there is greater interest among the airlines, especially in business aviation, which took a big hit in the last couple years, he adds.

Business aviation operators are starting to look at EFBs for avionics upgrades, MacKenzie notes. For business aviation applications, CMC offers the 10.4-inch PilotView, "which is in full-scale production and is being installed into a large number" of business jets such as the Bombardier Global Express, he continues. Rockwell Collins in Cedar Rapids, Iowa, is the system integrator on that aircraft, MacKenzie adds.

"There is no silver bullet to justify the installation of EFBs," says Merritte DeBuhr, product line manager for integrated systems at Carlisle Interconnect Technologies in Franklin, Wis. It will be a different situation for each end-user based on a mix of financial and technological benefits, he adds.

Each airline that wants to use an EFB must take into consideration long-term costs, such as how long will their fleets be in service—15, 20 years or more in some cases, DeBuhr says. "Once they know that they

can weigh the long-term costs and benefits."

They will then determine what is more effective in the long run—the installation of an EFB or upgrading the fixed cockpit displays, which may not even be an option, he adds.

EFB class definitions

There are three classes of EFBs. Carlisle's DeBuhr broke them down as follows:

"Class 1 is portable, basic software functionality (typically Type A DO-178B certification), not for use below 10,000 feet or during taxi, is not attached to an aircraft mounting device, and must be stowed during taxi, takeoff, and landing," DeBuhr says.

"Class 2 is approved for operation in all phases of flight, is portable, must be removable by the pilot without tools, has more software functionality than a Class 1 (such as moving maps), real time satellite weather updates, etc.," he continues.

"Class 2 is only approved for Type A and

(PMA)], which allows an FAA 145 repair station to test, repair, and place an FAA serviceable tag on the equipment."

Class 3 certification adds a great deal of cost to an EFB, CMC's MacKenzie says.

EFB requirements

Another factor improving attitudes among EFB designers is a push among the entire avionics community to work together on EFB technology.

The upcoming ARINC EFB Users Group meetings this year will help develop a common understanding of EFB issues and opportunities, leading to more rapid adoption, says Rick Ellerbrock, strategist at EFB provider Jeppesen in Englewood, Colo. "EFBs are becoming an essential tool in the flight deck"—improving situational awareness, which in turn improves pilot decision making and enabling the crew to connect in real time with the rest of the world."

The first ARINC Common EFB Users Group meeting is April 21 and 22 in Atlanta, and is hosted by Delta Airlines, with Southwest and Lufthansa as the co-chairs, DeBuhr says. "The meeting will bring everyone together—operators and manufacturers—in an effort to help all obtain a better understanding of EFB standards, systems, benefits, options, costs, and other issues regarding EFB technology and implementation."

Right now "there can be different requirements from day to day," DeBuhr says. Every now and then a company may fall short of meeting the FAA's intended requirements, which causes the FAA to implement changes and add new requirements, he continues.

Once the FAA puts something on their watch lists it affects all EFB products and installations going forward, and has caused some manufacturers to go back and adjust their product lines, DeBuhr says.

Lithium ion battery problem

One area the FAA is concerned about is with the use of lithium ion batteries as the backup power supply for EFBs; the batteries pose a risk of overheating which could cause fires or explosions.

The FAA put in a roadblock with EFB STCs because of issues with lithium ion batteries and the impact of these batteries on certification, Crowhurst says. Since that time navAero has switched from lithium ion to nickel metal hydride (NiMH) batteries



Pictured is a moving map of San Francisco airport shown using the new Jeppesen FliteDeck Pro solution.

B software applications and Type C applications that [have a Technical Standards Order (TSO)], such as the AMMD (airport moving map display).

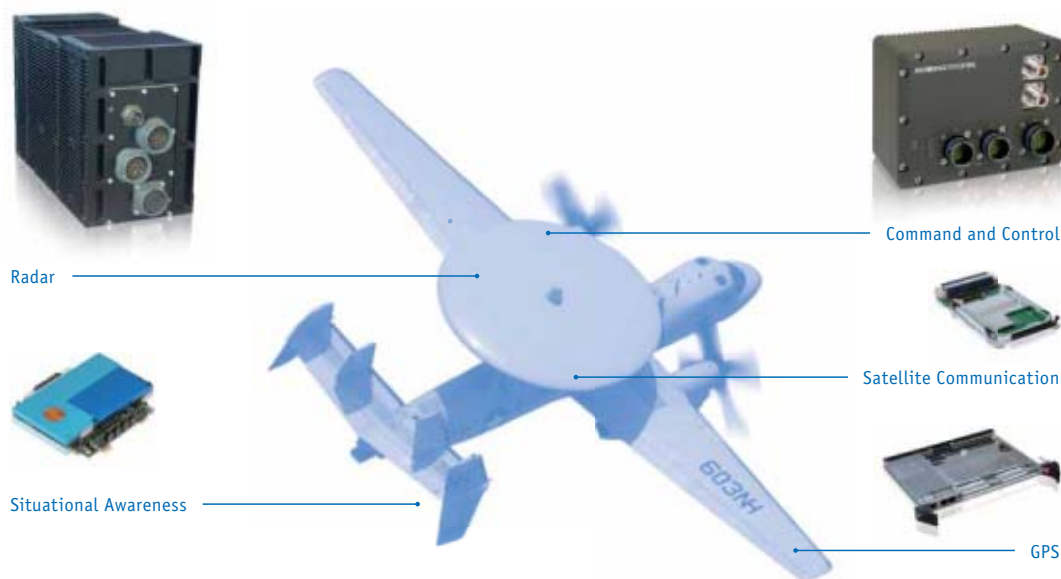
"Class 3 is installed equipment, which with operating system (OS) software functionality certified to DO-178B Type C applications, can be certified as part of the STC (Supplemental Type Certificate)," DeBuhr says "A DO-178 certified operating system is not required for a Class 3 installation if only Type A and B software applications are to be installed on the EFB system. In a Class 3 installation all the equipment is approved as part of the STC and therefore can [get a Parts Manufacturer Approval



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» SPECIAL REPORT

EFBs for military take on rugged, tactical form

Military pilots and commercial pilots want avionics technology that improves their decision-making and enables greater situational awareness. However, military avionics systems must be more rugged and more secure than commercial technology to survive the harsh environment of combat.

"The main difference with military applications compared to commercial EFB systems is that for some applications the military requires their data be secure," says Bill Ruhl, director of marketing at Astronautics in Milwaukee. "In the long run they eventually would like to have an EFB that can handle secure and non-secure technology," he adds.

"The primary goal for the military users is to increase mission effectiveness by enhancing situational awareness shared among the whole crew, and among the aircraft operating in the theater," says Scott Powell, enterprise manager for cockpit solutions, Aviation at Jeppesen in Englewood, Colo. EFBs in the cockpit provide a tactical advantage, he adds.

"The military market is driven less by the recession and more by global conflicts and humanitarian relief missions," says Rick Ellerbrock, strategist at Jeppesen.

"The special mission versions of transport aircraft such as the C-130s will require secure information and those are the aircraft we're interested in," Ruhl says.

Astronautics makes an electronic flight bag product for the military called the Tactical Flight Bag or TFB, says Bill Ruhl, marketing manager for Astronautics in Milwaukee, Wis. "TFBs could also help cut down on the number of computers that military pilots have to carry on board," he adds.

Ruhl's company offers two types of TFB solutions—single processor and dual processor, Ruhl says. The dual processor is more expensive but it partitions and protects flight critical applications in the hardware—running two separate operating systems on two separate processors, he explains. One processor runs a secure DO-178B Linux operating system; the other has Windows, Ruhl says.

The Airbus A400M transport aircraft is using the dual-processor device but with

PowerPC processors as it is running Green Hills Integrity operating system, which can only be hosted on the PowerPC, Ruhl notes. The Astronautics TFBs are also night-vision compatible, he adds.

"We've also talked to the military about using our dual processor system to do Blue Force tracking or red/black data, but right now the dual solution is too expensive," he continues. "We're looking at developing a single processor solution that performs this function, which would be more cost-effective," Ruhl adds.

For the map data, the military uses National Geospatial Intelligence Agency (NGA) data because it is free and it can include the classified information, Ruhl says.

Astronautics is also the system integrator for the Brazilian air force C-130 Avionics Modernization Program. They are integrating the next-generation cockpit with systems from Honeywell, Rockwell Collins, and others, he says. "We're proposing to retrofit existing aircraft with EFB single processor TFB," he adds.

The A-330 aircraft also uses Astronautics single-processor TFB, Ruhl says. This is a "unique version using a 12.1-inch display mounted on a table," he adds. "The typical single-processor display is 10.4 inches."

"There is a great deal of interest in the Jeppesen EFB for the C-17, C-130, and VIP fleets, and Jeppesen has already fielded Class 2 solutions on several C-130 and VIP aircraft," Ellerbrock says.

Esterline CMC Electronics in Montreal, Quebec, offers a military version of the PilotView EFB called the TacView, which they refer to as a portable mission display (PMD) rather than an EFB, says Loring MacKenzie, senior marketing and sales manager at Esterline CMC Electronics.

The TacView has the same features as the PilotView but is ruggedized, can inter-



The TacView portable mission display from Esterline CMC Electronics is night-vision compatible.

face with MIL-STD 1553 and ARINC 429 databases, is night-vision compatible, and has a keyboard designed so gloved fighter and military transport pilots can easily use the device, he adds.

Other TacView features include a tactical data link display for network-centric communications, portable mission planning, digital moving map, real-time weather imagery, electronic

aeronautical charts, and sensor imaging, according to a CMC release.

MacKenzie says the different name—TacView—came about because EFB is a civilian term used by business and commercial aviation. TacView speaks more to the mission characteristics of a military application, he adds.

BAE Systems uses the TacView for U.S. Navy C-130T aircraft, MacKenzie says. The Navy intends to employ two TacView systems per cockpit installation to transition to a paperless cockpit, by integrating aircraft data, procedure manuals, and interactive electronic charts into the device, according to a CMC release.

Lockheed Martin Aeronautics is also using the TacView for the U.S. Air Force C-130J Mobile Display System (MDS), MacKenzie adds.

The military market is positive for EFB integrators as well.

"For Carlisle the outlook for the military market is quite positive," says Merritte DeBuhr, product line manager for integrated systems at Carlisle Interconnect Technologies in Franklin, Wis. "The company has supported several on-site surveys and has demonstrated EFB-type installations" on U.S. military aircraft such as the KC 135, C-130, C17, C27J, Blackhawk helicopter, Chinook helicopter, and others, he adds.

SPECIAL REPORT

for its battery power, Crowhurst says.

"There are no FAA guidelines for using NiMH batteries," Toothman says. "Lithium batteries in the cockpit are coming under scrutiny by the FAA and we are using NiMH instead to enhance cockpit safety."

While hardware requirements and specifications are important, the future of EFBs will depend largely on software capability.

"In my opinion, the long-term trend with electronic flight bags will be a shift from hardware development to more robust software applications," Toothman says. In the next five years, the hardware platform will be considered a commodity, while software which expands the capability of the EFB (situational awareness, in-flight weather information, fuel management) will be in greater demand.

"EFB hardware continues to evolve, but software applications hold the greatest promise," Toothman notes.

"The latest technological development for the Class 2 EFB sector is the ability to interface with aircraft systems to allow

for the deployment of AMM applications with own-ship position shown," navAero's Crowhurst says. "This has been allowed to take place due to the foresight of the FAA and industry-leading data content providers like Jeppesen who has achieved a TSO for its AMM application that provides for the ability of a cost-effective Class 2 platform to host safety enhancing situational awareness software. Additional technology developments also include the ability of Class 2 (or Class 3) EFB systems to provide an access point to multiple forms of wireless communications pipelines for text and/or data transfer—satellite communications for anytime connectivity or WiFi or cellular (3G) for on-the-ground connectivity."

Officials of ABS Jets out of Prague, Czech Republic,

selected the navAero Class 2 EFB for their avionics upgrade plan, according to a navAero release. The EFB system received a European Aviation Safety Agency (EASA) Supplementary Type Certificate for the Embraer E135BJ Legacy business jet.

"Applications like charting and airport



A navAero Class 2 electronic flight bag is shown in an Embraer 145 Legacy cockpit.

Part Number	Total Channels	Common Voltage Channels	Kelvin Measurement*	Transorb ESD Protection	Address Busses	Enable Lines	Total Dose krad(Si)	SEU immune >MeV-cm ² /mg	DSCC SMD Number
MANY-MUX									
MUX8500	64	32	32	■	2	4	300	120	5962-0050201KXC
MUX8501	64	64		■	2	4	300	120	5962-0050202KXC
MUX8502	48		48	■	1	3	300	120	5962-0323401KXC
MUX8503	48	48		■	1	3	300	120	5962-0323403KXC
MUX8506	48		48		1	3	300	120	5962-0323402KXC
MUX8508	32	32		■	2	2	300	120	5962-0822601KXC
MUX8510	64	32	32	■	2	4	150	90	5962-0920201KXC
MUX8511	64	64		■	2	4	150	90	5962-0920202KXC
MUX8512	48		48	■	1	3	150	90	5962-0920301KXC
MUX8513	48	48		■	1	3	150	90	5962-0920302KXC
MUX8518	32	32		■	2	2	150	90	5962-0920401KXC
MINI-MUX									
MUX8520	16	16		■	1	1	300	120	5962-0922901KXC
MUX8521	16		16	■	1	1	300	120	5962-0922902KXC
MUX8522	32	32			2	2	300	120	5962-0923101KXC
MUX8523	32	32		■	2	2	300	120	5962-0923102KXC
MUX8530	16	16		■	1	1	150	90	5962-0923001KXC
MUX8531	16		16	■	1	1	150	90	5962-0923002KXC
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MUX8533	32	32		■	2	2	150	90	5962-0923202KXC
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» SPECIAL REPORT

moving map enhance our safety-of-flight operations,” says Daniel Holda, technical director of ABS Jets. “In the future, the deployment of the wireless capability will create an extremely independent way for us to have on-the-ground connectivity that is separate and apart from the airport infrastructure. This connectivity will give our

pilots a way to perform their briefings and pre-flight tasks right from the cockpit. And it will also give our crews the additional capability of being able to implement last-minute changes—all without leaving the flight deck.”

“The latest research elements are on taxi routing, automatic dependent

surveillance-broadcast (ADS-B) traffic, and runway alerting,” says Scott Powell, enterprise manager for cockpit solutions, aviation at Jeppesen. “While there are (and have been) research projects at Mitre, NASA-Ames Research Center, and Technische Universitat Darmstadt into the situational awareness improvements by leveraging these technologies—it will be a while before this technology is deployed on a widespread basis due to the entire ADS-B system needing to be in place, and corresponding equipage in aircraft for the value to be realized.”

The FAA’s Capstone project is quantifying the situational improvement offered by surface moving map applications and ADS-B traffic/alerting.

EFBs can provide airport moving map displays, engine performance applications, weather reports, satellite weather presentation capability, ADS-B information, etc., Carlisle’s DeBuhr says. “However, right now regarding ADS-B it is a one-way conversation with the airplanes talking to the ground systems. Once ADS-B In becomes available for display in the aircraft on the EFB the benefits of the EFB become significant.”

EFB offerings

IMS is launching a new line of Class 2 EFBs—the SkyTab 3201 and the SkyTab 4201—designed completely in house, Toothman says. “FedEx is the launch customer for the product,” he adds.

Its features include a sealed, passively-cooled CPU, Toothman says. “Potential Middle Eastern customers have been excited about the sealed nature of the EFB, due to the impact that dust can have on EFB service life, this is also a selling point for all airlines as it reduces to zero the number of moving parts in the device.

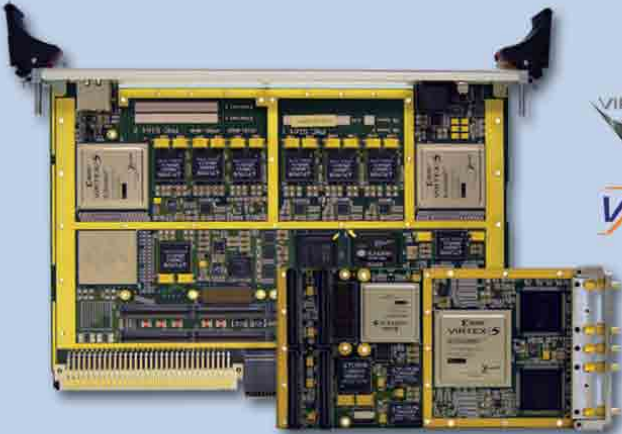
“Our Class 1 products, the SkyTab 1350 and the SkyTab 2350, are ruggedized, Windows XP-based EFB units,” he continues. “Our Class 3 units are the same as our Class 2, but have more rigorous testing to meet FAA qualifications.”


Jeppesen engineers designed their latest EFB software solution—the FliteDeck Pro—with the help of several operators, including Continental Airlines and Southwest Airlines, Jeppesen’s Powell says. “We worked directly with the pilots to design a tool targeted at pilots. Having customers as our design partners helped generate common workflow requirements to create a second-


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SPECIAL REPORT

Kontron computing modules used in electronic flight bags

Commercial off-the-shelf (COTS) modules from Kontron—microETXexpress and ETXexpress-AI—in San Diego are used in electronic flight bag applications.

EFBs are small computing platforms that require a unique modular form factor that can be easily upgraded, says David French, director of military and aerospace sales west at Kontron. French says he expects the product lines to flourish in this market as the economy turns around and aircraft operators start installing more EFBs.

Kontron's modules are compatible with Class 1, 2, and 3 EFBs, he says. Class 2 EFBs are going into many retrofit applications, French adds.

The modules are designed to the Computer-on-Module form factor open stan-



Kontron's microETXexpress modules are compatible with Class 1, 2, and 3 electronic flight bags.

dard—COM.0 specification—maintained by PICMG, and follow the Type 2 pin-out, according to a Kontron data sheet. The plug design and pin-out are identical, only the

module's size has been reduced to a compact 95 x 95-mm footprint. The available PCI Express lanes depend on the board design. The microETXexpress design also offers PCI Express or PCI support.

The ETXexpress-AI module uses 32-nm Intel Core i7/Core i5 processor technology and has wide graphics support, customizable PCI Express configuration, and ECC dual-channel RAM to ensure data accuracy, according to a Kontron data sheet.

according to a Jeppesen data sheet. Both tools are managed with Jeppesen's Data Distribution Management (DDM) system.

Astronautics offers single processor and dual processor EFBs, Ruhl says. The single processor device can support the Windows or Linux operating system, he adds. Linux enables users to run certified NextGen applications, Ruhl notes.

The dual processor partitions the certified applications on one processor running Linux, while the other processor runs Windows, Ruhl says.

Both Astronautics EFBs have capability for cockpit display of traffic information for ground operations in accordance with AC 20-519, video surveillance and control, fault log, satellite weather, document reader, checklists, electronic charts, airport mapping, performance, digital map (Falcon View), and mission planning, according to the Astronautics data sheet. The dual processor device also offers a full suite of ACSS SafeRoute applications including ADS-B based merging and spacing, as well as growth to host certified Type C applications such as Controller Pilot Data Link Communications (CPDLC) and ADS-B for controlling En Route traffic.

CMC's PilotView Class 2 EFB, which flies on Dassault and Embraer aircraft, features preflight planning; access to up-to-date aircraft documentation, checklists and flight planning information; en-route, approach charts, moving map displays, enhanced vision system displays; and graphical real-time weather information, according to the CMC data sheet. The PilotView has a display/processor unit and aircraft interface unit. ●

generation software platform for EFBs.”

With the new software “we are seeing training time reduced, and also a significant reduction in the number of touches the crew needs to make” when using the Jeppesen applications, freeing up more time for other tasks, Ellerbrock says. “They also can push highlighted charts to each other in the cockpit,” he adds.

FliteDeck Pro's operational features include:

- an open framework, enabling easy integration of third-party software and data across multiple aircraft types and

hardware platforms;

- the ability to share information between crew members to reduce crew workload;
- chart revisions through wireless or portable memory stick technology;
- the ability to record air traffic control taxi instructions; and
- integrated performance tools from Boeing, Airbus, and other airframe manufacturers.

Jeppesen chart applications that are integrated with FliteDeck Pro include AMM and terminal charts and a worldwide en-route map with weather overlays this spring,

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TECHNOLOGY FOCUS

Industry and government prepare counter-attacks against electronic parts counterfeiting

Military COTS procurement created lucrative opportunities for unscrupulous electronic component manufacturers, brokers, and distributors to satisfy demand for hard-to-find parts, but industry and government organizations are gathering their forces to fight back.

By **JOHN KELLER**

The advent of commercial off-the-shelf (COTS) electronics procurement in the U.S. Department of Defense (DOD) a decade and a half ago ushered in a host of new benefits, not the least of which are rapid and affordable weapons acquisition, broad opportunities for technology insertion, and the ability to use the most advanced technology before it goes obsolete.

Still, when the door opened for COTS, it didn't just let in benefits; some nasty problems slithered in, as well. One of the worst of these involves counterfeit integrated circuits, which at best confront systems designers with little or no traceability as to their origins and quality, and at worst are substandard or even non-functional components that could cause aerospace and defense systems to fail at crucial times.

Experts agree that about the only way of avoiding counterfeit parts is to purchase components only through authorized sources; that means only from the original manufacturer, approved distributors, or from an aftermarket supplier that original manufacturers have authorized. Simply buying from unknown brokers on the Internet who tempt purchasers with low prices can end up in disaster.

The problem

Counterfeit electronic components are a booming business in China and other places in Asia. Those who would manufacture and deceitfully market copycat parts are lured by demand for inexpensive components for new systems and retrofits—particularly for hard-to-find parts whose original manufacturers have discontinued making them.

COTS procurement seeks to introduce commercial business practices to the way the military acquires its weapons and systems. A big part of that is competition in price and time to market. As a result, military systems designers are under more pressure than ever before to deliver technology quickly and affordably, which can drive component buyers to find the

cheapest parts possible—no matter the source.

“Over the past 20 years, the military has relaxed their requirements a lot,” explains Steve McMinn, vice president of worldwide channel sales at field-programmable gate array (FPGA) specialist Altera Corp. in San Jose, Calif. “I think that for most higher-level managers it would be an eye-opener to see the kind of procurement practices going on in their organizations.”

Before COTS burst on the military acquisition scene in 1994, military systems designers looking for electronic parts had only a few acceptable supply chains to choose from. COTS changed that, and now there are many.

It's not a difficult scenario to understand; just follow the money. Major defense contractors put tremendous pressure on their suppliers to keep costs as low as possible, which creates a brisk demand for affordable parts—sometimes from shady sources.

“The pool of parts they can pull from now is much larger than it used to be,” explains John Sakamoto, senior director of the Altera military business unit. Put this together with the trend for systems designers to contract out subsystem manufacturing to cut costs wherever they can, and a perfect storm can gather. While there is an increase in outsourcing, “contract manufacturers operate on very slim margins,” McMinn says.

It's hard to blame the buyers and sellers.



Authorized sources of electronic parts have industry-standard test procedures in place to document component quality and traceability. Counterfeit parts are rarely subjected to such testing by their sellers.



The huge aftermarket parts warehouse at Rochester Electronics in Newburyport, Mass., is one of the largest existing stockpiles of authorized replacement parts.

This is a competitive situation for systems designers, involving razor-thin profit margins. Temptations are high to use questionable supply channels—the so-called “gray market”—to obtain electronic components affordably and on time.

“The number-one cause that keeps people away from the authorized sources is price, and the number-two cause is availability,” explains Chris Gerrish, co-president of Rochester Electronics LLC, an authorized aftermarket chip supplier in Newburyport, Mass. Systems designers, he says, “are tasked with getting parts as inexpensively as possible. They may not be aware of the dangers of buying outside the authorized supply chain.”

Aerospace and defense electronic systems designers also face unique challenges not often encountered in the consumer electronics market—diminishing sources of necessary parts. Consumer electronics are expected to function for a few years before being replaced with newer designs. It is rarely an issue to find replacement parts at all for these kinds of systems.

Military systems, however, must remain in the field for decades. During a typical system’s lifetime, electronic component manufacturers often stop manufacturing certain parts as demand wanes, yet the military still needs those replacement parts to keep systems functioning in the field.

When original manufacturers quit manufacturing, or “end-of-life” certain parts as demand for them dries up, the job of supplying them often falls to aftermarket houses such as Rochester and Lansdale Semiconductor Inc. in Phoenix. These aftermarket houses make deals with the original manufacturers, either to make lifetime buys and keep inventory on the shelf, or in some cases obtain licenses to continue manufacturing relatively old parts on a

small scale for organizations like the military that need the parts long term.

Sometimes, however, crucial parts fall through the cracks, and authorized sources either are unavailable to stock or manufacture these components, or component

buyers use the gray market because it offers the lowest price. These circumstances pose the most serious threats of encountering counterfeit parts.

“As time progresses, the excess inventory locations start to run low on these products, but demand is still there,” says Dale Lillard, president of Lansdale Semiconductor. “The

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Chinese realize this; all they need to do is look on the Internet to see what parts people want.”

The risks involved with buying outside of authorized electronics parts distribution channels can involve unpredictable system performance if mismarked counterfeit parts make their way inside; system failures if counterfeit parts cannot withstand the environmental rigors or military applications; or even military espionage.

U.S. government agencies have documented incidents of counterfeit parts in U.S. jet fighter aircraft, communications equipment, and other systems, although counterfeit parts have never been linked to any deaths of U.S. military personnel. In addition to potential failures and degraded system performance, experts say counterfeit parts also could enable foreign intelligence agents to gain access to sensitive communications and weapons systems.

“It’s a ticking time bomb,” Altera’s McMinn says. If organizations dip into the gray market to meet cost or schedule requirements, “the parts they buy for a year might be okay, and then they might get a load of counterfeit parts which would cause a lot of problems.”

In fact, short-term gain in price and schedule gained from drawing out of the gray market often as not can lead to long-term costs and schedule stretchouts if standard counterfeit parts cause problems that need to be corrected.

“The components we are talking about could go into critical systems—defense, medical, and transportation—that could be life threatening,” says Rochester’s Gerrish. “If they don’t work, there is a lot of cost and time that goes into recovering from that. You get a lower price on the gray market, but money is wasted on the back end with recalls, recoveries, and failures.”

Counterfeit electronic parts have been vilified in the industry—and for good reason—since the problem started cropping up in a big way several years ago. Complicating matters is the wide disparity in the quality of counterfeit parts, as well as the severity of the offense.

It would be easy if every counterfeit part were worthless, but that’s just not the case. Some counterfeit parts might do the job and never be detected. Others may have lower performance than advertised, and still others may not work at all. Not only is it difficult to catch these parts early enough to avoid problems, but once they go into systems, the parts have no traceability, and take time and expense to detect.

“The biggest issue is these parts can actually work,” Altera’s McMinn explains. “A counterfeit part can range from anything that doesn’t have a die in it, to parts that have a speed change or parts that are wrongly marked. Some of the parts are good parts, and sometimes those parts work fine.”

Altera’s Sakamoto says he has seen Altera-manufactured devices that have

In the end, experts say, taking a chance with gray market parts is simply not worth the risk. “Long term it is more expensive in every way you can think of,” says Rochester’s Gerrish. “In labor you are working on resolving problems rather than on developing new products.” If systems designers end up using counterfeit parts, “the total costs for that product are significantly higher than they are if you bought from an authorized source.”

Using authorized channels

So what is to compel systems and subsystems designers to purchase electronic parts only from authorized sources and so avoid the problems of counterfeit components? It’s a difficult problem because tight schedules and pricing often influence against making the right decisions.

Still, electronics component companies say the easiest solution is to stick with a reliable supply chain by purchasing only from the original manufacturers or authorized distributors.

“The biggest thing is awareness; not enough has been made of this,” says Altera’s Sakamoto. “There is a simple solution for this: if contractors buy from authorized, franchised distributors, then it is a non-issue. Otherwise, sooner or later they are going to get stung.” He says DOD officials and prime contractors need to do a better job of making it clear to suppliers and contract manufactur-

ers to buy from authorized parties.

“This doesn’t have to be a problem at all for military contractors if they purchase parts from authorized channels,” Sakamoto says. “We are doing our part to spread the word to buy only from authorized distributors,” echoes Altera’s McMinn.

“It’s important to shore up the sales channels, and not just use the gray market,” says Lansdale’s Lillard. “The primary thing you can do is buy from original manufacturers and their authorized sales channels.”

Purchasing officials at embedded computing specialist Curtiss-Wright Controls Embedded Computing in Leesburg, Va.,



Rochester Electronics remains a trusted source of aftermarket electronic parts because of the rigorous test procedures the company has in place for parts it buys and manufacturers.

changed hands through brokers several times, and that have had their original markings altered to indicate faster performance than the original design. Purveyors of counterfeit parts, he points out, “try to match a need with a supplier.”

Adding to the problems and confusion is the inability to trace counterfeit parts lots, which makes it difficult or impossible to separate counterfeit parts from legitimate parts in a company’s supply chain. “I know a procurement guy who bought slower-speed-grade parts, and started having field failures,” Altera’s McMinn says. “They knew there were only 200 parts with problems, but they couldn’t identify the problem systems.”

TECHNOLOGY FOCUS

try to avoid the counterfeit parts problem by planning for technology upgrades in their products before the electronic components they use go obsolete and become scarce in the market.

"We deal in a market where products have extended life cycles, and we have developed internal ways to mitigate or deal with the risks of obsolescence," says Mark Mooder, technology and product control manager at Curtiss-Wright. As a result, "we have had very limited exposure to true counterfeit components."

Curtiss-Wright's approach is designed to keep late-model technology that is readily available from original manufacturers and authorized distributors in the company's supply pipeline. "If you are not designing from the start to avoid risks, then you are going to trip into them," Mooder says. "As soon as you lose the true heritage of that component, then obviously you are introducing risk."

Ensuring ready access to authorized sources, through lifetime buys or frequent technology refresh, "gives you the greatest number of options," Mooder says. "Across the board, the large systems integrators have identified this as a concern of theirs, so it is a concern of COTS suppliers like Curtiss-Wright."

The role of DSCC

One of the most prominent military organizations that deals with electronic replacement parts is the Defense Supply Center Columbus (DSCC) in Columbus, Ohio. DSCC officials classify counterfeit parts as unauthorized copies with false markings or stampings. The organization has encountered fewer than 10 confirmed receipts of counterfeit electronic items, says a DSCC spokesman, "but we recognize it as a growing concern within the microcircuit industry."

Although DSCC officials say they have received only a small number of actual counterfeit parts, its officials have received "non-conforming" parts, which they say include unauthorized product substitutions. "Some result from delivery of non-approved parts, and when done with intent constitutes fraud," the DSCC spokesman says.

"When we have a non-conforming item, we investigate and take corrective action to keep non-conforming items out of the supply system," the spokesman says. "We will

very aggressively go after any supplier that knowingly provides us non-conforming or counterfeit parts."

According to an organization statement, DSCC has a series of checks and balances in place to block the flow of non-conforming or counterfeit parts from entering the supply chains. For example,

since August 2008 DSCC has excluded microcircuits from automated evaluation and award. Instead, discrete and microcircuit electronic parts are purchased manually and the organization has assigned additional staff to perform electronics parts purchases.

To further limit infiltration of defective,



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non-conforming, and counterfeit electronic parts, DSCC officials say, the agency started a Qualified Suppliers List Distributors (QSLD) program to follow best industry practices by using only factory authorized parts distributors.

Only independent parts distributors listed on the QSLD are able to receive contract awards for electronic parts without providing traceability prior to award, DSCC officials say. These suppliers can show they adhere to high operating standards, reducing the need for testing, engineering reviews, and other activities that can delay acquisitions and increase acquisition costs.

Once listed, QSLD suppliers are periodically audited for their adherence to the program, DSCC officials say. Even if the vendors are listed on the QSLD, however, DSCC still makes purchases manually.

If required electronic parts are not available through the QSLD program, DSCC parts buyers require suppliers to document 100 percent traceability to original component manufactures or their authorized distributors before contract award. When that cannot be done, DSCC performs testing and other engineering reviews on samples from part lots before purchase, using in-house capabilities at its electronic parts testing center.

In addition, DSCC has also expanded its use and tracking of the Government Industry Data Exchange Program (GIDEP) notices by adding resources and expanding the process to distribute periodic information solely related to suspect counterfeit electronics, officials say.

"We continue to reach out to industry and academia and are in contact with the Electronics Industry Alliance, Aerospace Industry Association, Semiconductor Industry Association, Society of Automotive Engineers, and the University of Maryland," the DSCC spokesman says.

"These organizations all have a continuous and active interest in issues impacting electronic parts and the challenges that the government and industry at large are facing in preventing the infiltration of non-conforming parts. DSCC is using this information to improve our processes and



Authorized parts are correctly marked to indicate quality and traceability. Counterfeit parts sellers often alter parts markings to indicate different performance parameters.

mitigate the risks associated with counterfeit material."

Potential solutions

Industry companies and organizations are starting to deal with counterfeit parts, and warnings seem to be taking hold. "People are starting to show up asking for parts numbers we haven't sold in a long time," says Lansdale's Lillard. "Now they're starting to realize the risk of getting counterfeit parts."

Still, the time when all of industry gets a handle on the problem is still well in the future. Lillard went to a recent industry meeting attended by prime defense contractors, and when the topic of counterfeit parts came up, "they looked like a deer in the headlights," he says.

"How do you prevent this problem?" Lillard asks. "What was really scaring these guys from Raytheon, Lockheed Martin, and others is there is a significant amount of counterfeit parts available on the Internet, but their procurement systems depend on the Internet. They can get parts cheaper on the Internet, but they realize they have a 30- to 50-percent chance that the part they get on the Internet could be counterfeit."

Company and trade association alliances have formed to enhance awareness of the counterfeit parts problem. Rochester, Texas Instruments in Dallas, and the Semiconductor Industry Association (SIA) in San Jose, Calif., launched the Anticounterfeiting Task Force that works with U.S. Customs and Border Protection to intercept counterfeit semiconductors and arrest suspected traffickers

in counterfeit semiconductors.

The task force also works with organizations like Immigration Customs Enforcement, Naval Criminal Investigative Service, and Internal Revenue Service, as well as the Department of Justice to fight electronic parts counterfeiting.

One industry problem also revolves around industry confusion on where to find authorized supply sources for electronic parts. "Customers told me they are not sure who is authorized, and who is not," says Rochester's Gerrish. "Brokers sometimes say they are authorized when they actually are not."

To help alleviate the confusion, the Anticounterfeiting Task Force created the online Electronics Authorized Source Directory (ASD) at www.authorizedcomponents.com that enables users to look up parts by manufacturer and region to come up with lists of authorized electronics parts sources in their areas.

"This information comes directly from these manufacturers," Gerrish says. "It helps tell who is legitimate, and who is not. This is something we are talking to suppliers like Intel, AMD, and Texas Instruments about. I talk to customers on a daily basis on what we can do to better educate of the dangers of substandard counterfeit parts."

Other organizations also are getting involved. The National Electronic Distributors Association (NEDA) in Alpharetta, Ga., released guidelines in February on returns in an attempt to reduce the number of counterfeit electronic parts entering the electronics supply chain.

"We thought it was a good opportunity to publish these [guidelines] as best practices for distributors," said Robin Gray, executive vice president of NEDA, in the 4 Feb. issue of *EDN* magazine. "About the only way counterfeit products can get into the authorized supply chain is through returns. We wanted to make sure that authorized distributors practice these types of policies and that those who don't [do so] consider implementing them as soon as possible."

The NEDA return guidelines involve sealable packaging; verification of purchase orders, quantities, and dates; and visual inspection of parts to determine whether additional handling or processing may have occurred. ●

PRODUCT INTELLIGENCE

Network-centric data sharing fuels adoption of solid-state memory

By **COURTNEY E. HOWARD**

"Solid-state storage devices are becoming more prevalent in military and aerospace applications," explains Ken Owens, chief executive officer at solid-state memory specialist Conduant Corp. in Longmont, Colo. "Solid-state drives (SSDs) enjoy a number of advantages over spinning hard drives."

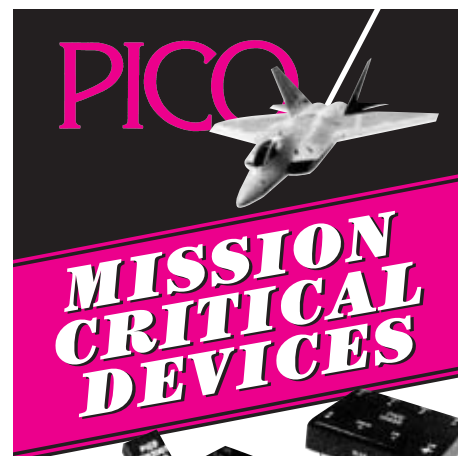
Jaden Ghylin, technical director at Crystal Group in Hiawatha, Iowa, agrees, noting "a huge market shift toward solid-state technology in military applications. There are many reasons for this shift, but the major benefit that customers see is the high reliability of SSDs compared to rotational hard disk drives." The risk of a traditional disk drive failing is very real and is not acceptable, he says. Conversely, solid-state drives provide a high-reliability alternative with no moving parts.

"Traditional disk drives are a weak link in rugged deployments that subject storage equipment to vibration, shock, and wide temperature swings," Owens adds. "Today's SSDs have no moving parts and tolerate the rigors of field deployment.

"With no moving parts, solid-state drives are by definition more rugged," Owens continues. "With no spin-up, they start up quicker, are quieter, and don't suffer mechanical delays, improving both access time and latency." Because there is no actuator movement, SSDs are deterministic—files are written in their entirety without the fragmentation that's unavoidable with hard disk drives, he says.

"Due to the lack of any mechanical movements required to seek data, SSDs are able to access data on demand at speeds 10x to 100x faster than rotational hard drives," Ghylin says. "This trait can considerably reduce or eliminate lag associated with loading files, opening programs, or booting the system."

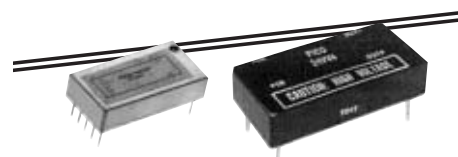
Solid-state memory is a great choice for storage in mil-aero environments for a number of reasons, says Tom Bohman, product marketing manager at Curtiss-Wright Controls Electronic Systems in Fairborn, Ohio. "They are rugged enough to go into mil-aero systems and survive. SSDs have no moving parts, good shock



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» PRODUCT INTELLIGENCE

and vibe characteristics, the ability to withstand extended temperature ranges, and reduced size, weight, power, and cost (SWaP-C)."

In the realm of power consumption, solid-state drives are a "green" technology. "With today's focus on green industry and sustainability, it's important to note that SSDs are more energy-efficient than hard drives," Owens says. Solid-state storage performs about 1,000 operations per watt, compared with five operations per watt for disk drives.

Price also is driving the adoption of solid-state drives in mil-aero applications. "Cost has been one of the factors inhibiting adoption of solid-state drives; yet, prices for SSDs are dropping dramatically and the capacities are increasing each quarter," Owens says.

In 2002, solid-state drives were being used to replace tape in instrumentation and test systems, Bohman explains. At the time, a 500-gigabyte, solid-state drive cost more than \$1 million, offered data throughput at 80 megabytes per second, and was a full

ATR in size. Today, that same 500-gigabyte, solid-state drive in highly ruggedized form costs less than \$35,000, fits on two 3U VPX-based cards, and sustains throughput of up to 800 megabytes per second.

"In the past, SSD was out of the realm of possibility for all but the most high-end requirements," Bohman continues. "Now, SSD is really very practical to use in the entire rugged deployed fleet. It is within financial grasp of all mil-aero programs. Technology advances in the past seven years have made that possible."

Price and capacity had prevented SSDs from being used in large storage arrays in the past, Ghylin admits. "However, it is now possible to outfit multi-terabyte storage systems completely with solid-state technology at a price that won't knock your purchasing agent out of their chair. In fact, we are currently providing the RS47F system with up to 12 terabytes of solid-state drive storage to multiple customers for use as a large storage array in mobile platforms.

"The military has always looked at SSDs

for resilience to vibration, shock, temperature, and altitude," Ghylin explains. "As prices have come down, using an SSD is now affordable and it comes with all the environmental benefits built in. We are seeing an increase in SSD use due to price declines and capacity increases."

SSDs are being employed not only in new platforms, but also to upgrade existing land vehicles, ships, and aircraft. "Curtiss-Wright solid-state technology is now in netcentric systems," Bohman reveals. "We are providing rugged file servers with solid-state memory replacing rotating drives in many rugged environments." In fact, Curtiss-Wright sold a solid-state, network-attached storage (NAS) device to a U.S. Army program for use in military land vehicles. The solid-state, rugged file server sits on a network and serves as a single repository for all the processors in the vehicle.

"All processors boot from and store data out to the file server, and that includes two devices streaming digital video," Bohman adds. "The server can then be removed from the battlefield and brought back for data playback, display, and analysis." For this and other reasons, Curtiss-Wright incorporates encryption technology into its solid-state systems. "As critical data is put into nonvolatile memory, it is encrypted. Enemies can't make use of the data on the SSD should it fall into the wrong hands."

The company also is infusing its solid-state drive products with secure-erase technology. "When you have one terabyte of solid-state memory, it can take 16 hours to overwrite the information. To get around that, we provide encryption and technology to "zeroize" or sanitize the key. Without the key, you cannot decode the data. It takes only milliseconds to zero the key and basically eradicate a terabyte of data."

In the future, it is clear that technology firms such as Conduant, Crystal Group, Curtiss-Wright, and others will continue to provide solid-state data storage with even greater SWaP benefits.

"We're putting more and more capacity in ever smaller spaces and it's costing less," Bohman says.

"The future of SSDs at Crystal is really focused on packaging more drives in smaller spaces to provide higher performance and higher capacities," Ghylin notes.

"The future will bring higher capacities, lower prices, and smaller form factors," says Owen. ●

New HiRel memories complete the design



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ELECTRO-OPTICS WATCH

Laser-based firing to improve reliability, affordability, and safety in Army artillery systems

By **JOHN KELLER**

PICATINNY ARSENAL, N.J.—U.S. Army field artillery experts are trying to replace primer-based firing systems with high-temperature, diode-pumped lasers in

heavy artillery to improve reliability, affordability, and safety, Army officials say.

The Joint Munitions & Lethality Contracting Center of the Army's Armament Research, Development, and Engineering Center (ARDEC) at Picatinny Arsenal, N.J., plans to issue an industry request for proposals (RFP) later this month to develop ways to manufacture high-temperature, diode-pumped lasers as replacements for primer-based ignition systems in 155-millimeter artillery guns.

This kind of high-temperature diode-pumped laser, which will be part of a solid-state laser ignition system (SSLIS), must be rugged enough to withstand the extreme shock involved in firing



The M777 155-millimeter lightweight howitzer artillery, shown above, is a prime candidate to use high-temperature diode-pumped lasers to replace the gun's primer-based firing system.

Continued on page 28

DARPA seeks to develop optics for space-based video surveillance system

By **JOHN KELLER**

ARLINGTON, Va.—Astronomers at the U.S. Defense Advanced Research Projects Agency (DARPA) in Arlington, Va., plan to develop a large, diffractive optics membrane and communications equipment for a geosynchronous orbit-based telescope, which is to be part of a space-based video surveillance system.

The program is called Membrane Optic Imager Real-time Exploitation (MOIRE), for which DARPA officials say they will issue a broad agency announcement (BAA) soon.

The MOIRE program seeks to provide persistent, real-time, tactical video to the warfighter. Developing diffractive membrane optics could help pave the way to low-cost geosynchronous imaging, DARPA scientists believe.

Ultimately, DARPA wants to develop a 20-meter system providing 24/7 visible

National Imagery Interpretability Rating Scale (NIIRS) 3.5+ coverage over denied areas with at least a 1 Hz rate, a field of view larger than 60 square miles, with a cost less than \$500 million each. Phase-3 of the MOIRE program will develop a 10-meter diffractive membrane.

The future MOIRE program BAA will seek industry proposals that address large, inexpensive, lightweight, deployable, diffractive membrane optics for geosynchronous orbit imaging systems; near-real-time image stabilization and tactical geolocation knowledge; a telescope design that increases spectral bandwidth; stability and dynamics of the large structure in geosynchronous orbit; and target motion detection capability for highway speeds.

More information is online at <https://www.fbo.gov/spg/ODA/DARPA/CMO/DARPA-SN-10-31/listing.html>. ●

Navy asks OASYS Technology to develop multispectral sensors for unmanned aerial vehicles

Systems designers at OASYS Technology LLC in Manchester, N.H., won a \$10.6 million contract to develop an unmanned airborne multispectral sensor suite for advanced imaging technology in unmanned aerial vehicles (UAVs). Awarding the contract were officials of the U.S. Naval Air Warfare Center Aircraft Division in Lakehurst, N.J. OASYS Technology specializes in multispectral sensors, and has expertise in rugged ultraviolet through infrared sensors, common-aperture multispectral sensor systems, laser optical subsystems, precision motion systems, and laboratory instruments. For more information, visit the Naval Air Warfare Center Aircraft Division online at www.navair.navy.mil/lakehurst, or OASYS Technology at www.oasys-technology.com.

Irvine Sensors, Optics 1 to deliver thermal imaging systems to Naval Surface Warfare Center

Optics 1 Inc., an optical systems designer and manufacturer in Manchester, N.H., needed thermal imagers for clip-on thermal imager (COTI) systems that Optics 1 is building for the U.S. Naval Surface Warfare Center in Crane, Ind. They found their solution from Irvine Sensors Corp. of Costa Mesa, Calif. Irvine Sensors is a subcontractor to Optics 1, supplying thermal imagers for the COTI systems, which Optics 1 is building under terms of a \$37.8 million contract from Naval Surface Warfare Center, Crane, for Navy special operations forces. The COTI has been designed to clip onto existing military night-vision goggles and provide users with thermal images to complement the amplified low-light images that goggles can currently provide. Such dual capability has been long sought by the military and is intended to enhance imagery obtainable from the existing night-vision goggles and provide images in circumstances where physical barriers, atmospheric conditions, or lack of light limit the effectiveness of the existing goggles. ●

» ELECTRO-OPTICS WATCH

Laser-based firing from page 27

large-caliber artillery. The RFP is anticipated for release before the end of this month.

Army experts want to replace mechanical primers with lasers because of the difficulty and expense of using primer-based ignition systems, which are

black powder-filled brass cartridges.

The Army's LW155 primer-based ignition systems can cause problems, such as jamming complex, high-maintenance primer feed mechanisms, as well as premature firing due to primer sensitivity, Army officials say. These explosive primers also

are difficult and expensive to manufacture, store, monitor, resupply, and retire from service at the end of their life cycles.

Laser-based artillery firing systems, on the other hand, are expected to reduce weapon logistics and provide safe, reliable propellant ignition. SSLIS technology uses laser energy to ignite the artillery shell's propelling charge, rather than using explosive energy from primers.

Army officials say a militarized solid-state laser ignition system, through improved production, could reduce the unit cost of artillery firing systems by as much as 40 percent.


SSLIS is potentially applicable to the M777A2 Howitzer (LW155) and carries potential for application to M109A6 Paladin 155-millimeter, self-propelled artillery system, and other U.S. 155-millimeter guns.

Army officials say this effort will use unique fabrication processes, advanced materials, and component configurations not typically found in industry-standard manufacturing practices.

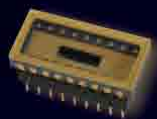
The Army issued an industry request for information on laser artillery ignition technology last October. Companies that have expressed interest in the project so far are Beamstop'r Inc. in Beachwood, Ohio; Fraunhofer USA Inc. in Brookline, Mass.; High Power Devices Inc. in North Brunswick, N.J.; Laser Diode Array Inc. in Auburn, N.Y.; Lasertel Inc. in Tucson, Ariz.; Lasermix Inc. in Rochester, N.Y.; M7 Electro-Optics in Bridgeton, Mo.; Pacific Scientific Energetic Materials Company Inc. in Hollister, Calif.; and Rofin-Sinar Inc. in Plymouth, Mich.

Army officials say they will compete this project openly, resulting in a nine-month, cost-plus-fixed-fee contract with a six-month option. The RFP will be posted at <http://procnet.pica.army.mil> by the end of this month. The presolicitation number is W15QKN-10-R-0202.

For questions or concerns, contact Jessica Stogner at Picatinny Arsenal by phone at 973-724-6965, by e-mail at jessica.l.stogner@us.army.mil, or by post at Jessica Stogner, Contract Specialist, CCJM-JA, Bldg. 10, Picatinny Arsenal, N.J. 07806-5000.

More information is online at <https://www.fbo.gov/notices/611b2ebfd283054368db91062919d60d>. 

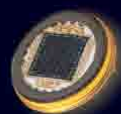
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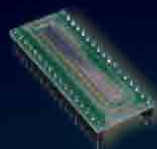
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» PRODUCT APPLICATIONS

DATABASES AND NETWORKING

Airbus looks to DDC for MIL-STD-1553 avionics databus components for A350 jetliner flight control

Officials at Airbus, the European passenger jet manufacturer in Toulouse, France, needed MIL-STD-1553 avionics databus components for the company's new generation of A350 XWB jetliners. They found their solution from Data Device Corp. (DDC) in Bohemia, N.Y.

Considered a standard, MIL-STD-1553 has caught the attention of commercial aircraft manufacturers like Airbus that want to use 1553's inherent reliability, robustness, maturity, and EMI performance in commercial avionics, DDC officials say.

Airbus based its selection on DDC's experience supplying MIL-STD-1553 data



bus boards, components, and 1553 software solutions for military, commercial, and aerospace applications, and competitive pricing. Another important consideration was that DDC's products facilitate achieving RTCA/DO-254 Level A certification, a significant factor in the avionics industry.

For more information, visit Airbus, an EADS company, online at www.airbus.com, or DDC at www.ddc-web.com.

RECONNAISSANCE AND SURVEILLANCE

IceWEB to deliver 24-terabyte geospatial intelligence information storage platform to U.S. Navy

IceWEB Inc., a provider of purpose-built appliances and building blocks for cloud storage networks, won an order for a customized Geospatial Intelligence platform from the U.S. Navy.

"We are excited to be afforded this opportunity to support the critical missions of yet another Department of Defense customer," says John R. Signorello, CEO of IceWEB. "The Geographic Information System platform we are providing to the Navy will be populated with a premier-quality imagery base map that will be used to track military assets and sensor data."

This 24-terabyte system order is further confirmation that our products continue to gain traction in both the commercial and the government market sectors," Signorello adds.

POWER ELECTRONICS

BAE Systems to provide onboard vehicle power system to U.S. Marine Corps

BAE Systems won a contract to develop an onboard vehicle power management system to increase electric power available to ground forces. The contract calls for installation of a power management system in a government-furnished High Mobility Multipurpose Wheeled Vehicle (HMMWV) for test and evaluation by the Marine Corps in the summer of 2010.

The Marine Corps is evaluating systems from two suppliers and plans to award a contract for five to 10 additional systems later this year.

The system is designed to more than triple the HMMWV's electric power output and provide exportable power to support facilities such as forward-deployed command centers and field hospitals. It also can provide mobile emergency power during natural disasters. The contract award is part of the Marine Corps' Onboard Vehicle Power program, funded by the 2009 American Recovery and Reinvestment Act.

"BAE Systems recognizes the need for more electricity to power the equipment of the modern military," says Marion Van Fosson, general manager of military

vehicle systems for BAE Systems. "Our system supports the Marine Corps' commitment to develop and field new solutions that reduce energy consumption and dependence on fossil fuels. Most importantly, the technology will help improve mission effectiveness."

BAE Systems will perform vehicle integration work that expands the HMMWV's power generation capability to 30 kilowatts of continuous mobile onboard power, directly supporting Marine Corps expeditionary units. The integrated, modular, scalable system generates and manages power for use on the vehicle and as an exportable power source, eliminating the need for towed generators and improving the HMMWV's mobility.

The system also manages electrified automotive accessory systems, such as water pumps, engine fans, power steering pumps, and air conditioning. Electrifying these traditionally belt-driven systems improves mobility by providing more horsepower to drive the vehicle, improving fuel economy, and extending engine life.

BAE Systems' onboard power management system is currently used on the U.S. military's Paladin Integrated Management vehicle and demonstrated on the HMMWV, family of Medium Tactical Vehicles, and Stryker vehicles.

COMMUNICATIONS EQUIPMENT

Harris wins \$25 million contract from Northrop Grumman for communications backbone of Army Battle Command System

Highband networking radios from Harris Corp. will form the communications backbone of the U.S. Army's new Integrated Air and Missile Defense Battle Command System (IBCS). As a member of Northrop Grumman's IBCS team, Harris will supply its radios to carry critical battle-command information, and will provide system and network engineering services over the five-year life of the program.

IBCS will integrate the fire-control networks of current and future air and missile defense systems. This command system will enable warfighters to use any combination of sensors and weapons to achieve mission objectives in a true open-architecture environment, reveals a representative.

The design of the Harris Highband Networking Radio (HNR) ensures all information from the battle command center will arrive at the right location to defend troops against a missile attack. This radio includes the first-ever use of directive beam technology to achieve higher throughput over longer distances in a robust, self-forming, and self-healing directional mesh network.

The Harris HNR system is a part of the

» PRODUCT APPLICATIONS

U.S. Army's WIN-T Increment 2 program.

"Designed from the ground up to support the networked battlefield, our Highband Networking Radio will provide the solid, yet mobile, communications backbone required to ensure critical information on the IBCS reaches the right location at the right time," says Wes Covell, president, Harris Defense Programs.

Systems that will be integrated via IBCS include:

- Patriot, Surface-Launched Advanced Medium Range Air-to-Air Missile (SLAMRAAM);
- Joint Land Attack Cruise Missile Defense Elevated Netted Sensor (JLENS);
- Improved Sentinel Radar;
- And, if the U.S. Department of Defense directs the inclusion, Terminal High Altitude Area Defense (THAAD) and Medium Extended Air Defense System (MEADS).

AIRBORNE COMPUTERS

Avionics computers for Navy combat jets come from General Dynamics in \$30.6 million contract

Avionics computer systems designers at General Dynamics Advanced Information Systems in Bloomington, Minn., will provide the U.S. Navy with 118 Type 3 advanced mission computers for carrier-based F/A-18 and E/A-18G jet fighter-bomber and electronic warfare aircraft under terms of a \$30.6 million contract.

The advanced mission computer is a rugged computer processor for avionics that can be configured to meet the general-purpose digital I/O, video, voice, and graphics processing needs of military avionics.

Built on an open-systems architecture to enable rapid technology insertion, the advanced mission computer uses commercial off-the-shelf (COTS) technology to provide high-performance computing for laboratory use or in harsh-environment avionics, ground-based, and shipboard computing applications.



The advanced mission computer is suitable for a variety of applications, ranging from embedded module functions to full-scale, multi-computer configurations in applications such as mission processing, display processing, stores management, and information management.

The contract to General Dynamics is for full-rate production of 118 Type 3 advanced mission computers. Work will be in Bloomington, Minn., and should be finished by December 2011.

Awarding the contract were officials of the Naval Air Systems Command at Patuxent River Naval Air Station, Md.

AVIONICS

Flight- and mission-control computers for BAMS maritime patrol UAV to come from Curtiss-Wright

Unmanned aerial vehicle (UAV) designers at Northrop Grumman Aerospace Systems in San Diego needed flight-control and mission-management computers for the U.S. Navy Broad Area Maritime Surveillance (BAMS) UAV program. They found their solution from Curtiss-Wright Controls Inc. in Charlotte, N.C.

Curtiss-Wright Controls won a \$25 million contract from Northrop Grumman to provide the Advanced Mission Management System (AMMS) for the BAMS program. BAMS is a maritime patrol variant of the RQ-4 Global Hawk long-range, high-altitude UAV.

BAMS will give the Navy a persistent maritime intelligence, surveillance, and reconnaissance system to protect the fleet and provide a capability to detect, track, classify, and identify enemy ships and other maritime targets in the open ocean and in coastal waters.

Curtiss-Wright will design, develop, and manufacture BAMS UAV AMMS units at the company's Motion Control facility in Santa Clarita, Calif. Hardware deliveries will start at the end of 2010 and continue through 2011.

For more information, visit Curtiss-Wright Controls online at www.cwcontrols.com.

COMMUNICATIONS EQUIPMENT

Raytheon wins \$38 million U.S. Air Force delivery order to modify weapons training equipment

Raytheon Co. is modifying weapons data link equipment used in pilot training

for F-15 fighter aircraft under terms of a \$37.9 million contract from the U.S. Air Force for the Air Force Training Frequency Relocation (TFR) program.

TFR is the Air Force's initiative to modify GBU-15/AGM-130 weapons data link equipment to comply with federal reallocation of radio frequencies from governmental to commercial use. The first delivery order, issued concurrently with the 2007 IDIQ contract award, was valued at \$31.8 million and covered nonrecurring engineering work on the program.

"We have extensive experience working on data link equipment, from designing, engineering, and manufacturing new systems, to repairing and upgrading existing data links," says Wayne Iurillo, RTSC vice president of Customized Engineering and Depot Support. "This contract draws on the depth of our experience, the breadth of our expertise, and the strength of our commitment to providing the very best products, systems, and services to our customers."

SIMULATION AND TRAINING

SAIC to develop U.S. Army aviation crew member simulators

U.S. Army aviation commanders need integrated crew member simulators for CH-47 and UH-60 helicopters under the Non-rated Crew Member Manned Module (NCM3) program. They found their solution from Science Applications International Corporation (SAIC) in McLean, Va.

SAIC will develop the first CH-47 Chinook and UH-60 Black Hawk helicopter simulators under terms of a \$12 million order from the U.S. Army's Program Executive Office for Simulation, Training, and Instrumentation (PEO STRI).

The NCM3 simulators will integrate with the Army's Aviation Combined Arms Tactical Trainer (AVCATT) simulators.

Work on the 28-month contract will be in Orlando, Fla. The delivery order was awarded under the second STRI (simulation, training and instrumentation) Omnibus Contract (STOC II).

PEO STRI's NCM3 program provides a collective training system to meet aviation crew member training requirements. The NCM3 is a transportable, multi-station, virtual simulation device designed to support individual, crew, and collective training. Under the delivery order, SAIC will design,

PRODUCT APPLICATIONS

develop, integrate, test, deliver, and maintain two mobile variants equipped with helicopter crew member simulator modules to support gunnery and crew coordination training.

"While prototype crew member simulators have been available, the cost-effective development of full-production integrated simulators for helicopter crew members is a first, enabling non-rated crew members to train on critical, coordinated tasks like gunnery, sling load, and hoist operations with pilots," says Beverly Seay, SAIC senior vice president and business unit general manager.

"This delivery order expands our virtual simulation product line in aviation training, and enables us to help PEO STRI ensure that America's warfighters receive the best training possible," Seay adds.

CONNECTORS

Armored vehicles make use of plastic circular connectors from ITT
ITT Interconnect Solutions in Santa Ana, Calif., report their company's APD Series plastic circular connectors are being specified for use as military connectors in military wheeled armored vehicles for onboard applications that do not require mil-spec connectors.

The company's APD Series connectors are designed to the automotive DIN 72585 (now ISO 15170) specification.



"Military and defense applications have traditionally used rugged, metal connectors fully qualified to military specifications, however the need to reduce government spending has opened the market for non-military-type components, as not all military vehicles required the same level of reliability," says Keith Teichmann, director of marketing for ITT Interconnect Solutions.

"While the inner frame of wheeled armored vehicles incorporates weaponry and radio or drive controls that require

military-specified connectors, other applications within the vehicle—such as lighting, mirrors, and cooling and heating functions—use more cost-effective and lighter plastic connectors," Teichmann continues.

ITT APD connectors have a secondary locking system for high-pin-count

applications. The connectors can handle as much power as 48 volts, are available in layouts ranging from 1 to 51 contacts, resist the effects of high vibration, and are sealed to IP67/IP69K ratings.

For additional information, visit ITT Interconnect Solutions online at www.ittcannon.com.

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Open VPX 1.0 in Military Systems

EXPERT SPEAKER: *Bob Ford, Senior Engineer/Scientist and Associate Technical Fellow Boeing Defense, Space & Security*

The OpenVPX Industry Working Group, made up of companies within the VME embedded computing industry, came together last year to suggest system interoperability guidelines for the VPX (VITA 46) high-speed embedded computer switch fabric. The OpenVPX V1.0 Specification was completed on schedule last fall has now moved into the VITA 65 working group. The OpenVPX and VITA 65 groups are trying to resolve interoperability conflicts that have made it difficult for lead systems integrators to make VPX components from different vendors work easily together. This webcast with industry experts will discuss the OpenVPX Specification, how to get started with OpenVPX, how OpenVPX applies to military systems, and more.

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» RF AND MICROWAVE

Raditek introduces coaxial circulator that operates from 650 to 1000 MHz at 100 watts

Raditek International Inc. in San Jose, Calif., is introducing a compact, wide-bandwidth coaxial circulator

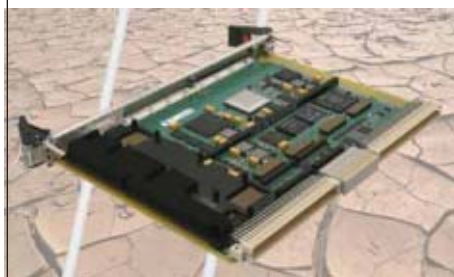


that operates from 650 to 1000 MHz at 100 watts. The RADC-650-1000M-N23-100WR-b has N-Type female connectors and 100 watts of power handling. The device has 0.8 dB insertion loss, 14 dB isolation, and 1.60:1 VSWR. It measures 48.5 millimeters wide, 53.5 millimeters long, and 20.8 millimeters tall. For more information, visit Raditek online at www.raditek.com.

» EMBEDDED COMPUTING

6U VME computer boards based on Freescale QorIQ P4080 microprocessor introduced by Curtiss-Wright

Curtiss-Wright Controls Embedded Computing in Ottawa is introducing SVME/DMV-186 rugged, 6U VME64 computer boards with the Freescale QorIQ P4080 microprocessor. The computer board provides as many as eight Power Architecture processor cores and data-path acceleration logic, as well as network and peripheral



bus interfaces. The SVME/DMV-186 single-board computer augments the I/O capabilities of the QorIQ P4080 processor, making the CPU board suitable for rugged military embedded applications, such as tactical aircraft, armored vehicles, and rugged naval systems. The SVME/DMV-186 is pin-out compatible with previous generations of Curtiss-Wright Controls embedded computer offerings, and can speed technology upgrades to the next generation of Power Architecture processors for legacy systems and applications. For system expansion, the SVME/DMV-186 provides two PMC/XMC sites supporting the acquisition, processing, and distribution of sensor data, such as video, radar, and sonar data. The single-board computer has an I/O complement of three Gigabit Ethernet ports, options for multifunction RS-232/422/485 serial ports, MIL-STD-1553, Serial ATA (SATA), and TTL and differential discretes. For more information, visit Curtiss-Wright online at www.cwcembedded.com.

» CONNECTORS

Rugged connector for avionics released by ITT

ITT Interconnect Solutions in Santa Ana, Calif., developed a 19-way commercial Pogo pin connector and cable assembly that meet electrical and mechanical specifications for aircraft electronics, medical test and diagnostic imaging equipment, and instrumentation and industrial equipment. "The 19-way Pogo pin connector features our proprietary Pogo pin technology, which achieves low contact resistance under 10mA and guarantees reliable and robust performance and a lifespan of more than 5,000 mating cycles," says Keith Teichmann, director of marketing for ITT Interconnect Solutions. "The commercial Pogo cable assembly also provides exceptional EMI shielding with 100 percent effectiveness throughout the entire assembly." The 19-way commercial Pogo pin connector features stainless-steel shells, snap-on breakaway coupling, and an interfacial seal. The rugged connector's mating



system is tactile and audible with an ergonomic grip for easier handling. The cable assembly includes bulkhead, front mount, receptacle, plug with RJ45, and in-line plug options. For more information, visit ITT Interconnect online at www.ittcannon.com.

» POWER ELECTRONICS

Distributed power supply for industrial computing introduced by Emerson

Emerson Network Power in Carlsbad, Calif., is introducing the DS760SL distributed power supply in a slimline form factor for space-constrained applications in server storage, industrial computing, and enterprise server racks. The power supply is rated for 748 watts of primary output power at 63.3 amps. It features a secondary 5 Vsb housekeeping output that provides 12 watts at 2.4 amps for powering standby circuitry. It accepts a wide operating input voltage of 90 to 264 volts. A 1U form factor gives the DS760SL a power density of more than 18 watts per cubic inch. It features opposite-side AC inputs and DC outputs and supports warm-swap installation, enhancing system-level serviceability. Designed to plug into equipment backplane or a power distribution unit, the DS760SL also supports parallel operation of as many as four power supplies. The DS760SL has a variable-speed smart fan, N+1 redundancy, and internal ORing controllers to minimize unplanned downtime. It offers an operating efficiency of approximately 91 percent at 230 volts AC (50 percent load) and delivers a demonstrated mean time between failures (MTBF) of more than 500,000 hours when

» NEW PRODUCTS

used under normal operating conditions. For more information, visit Emerson Network Power online at www.powerconversion.com.

» RUGGED COMPUTERS

Rugged rackmount computer for embedded computer control introduced by Stealth Computer

Stealth Computer in Woodbridge, Ontario, is introducing the Model SR-2625F fanless quiet rack server in single- or dual-system designs for applications in embedded computer control, human/machine interfaces, thin clients, and interactive kiosks. "Constant cooling fan noise can be very distracting and annoying. The Stealth Model: SR-2625F fanless PC operates in complete silence," says Ed Boutilier, president and chief executive officer of Stealth Computer. The fanless rugged computer has a



rugged aluminum chassis that acts as passive heat sink for computer cooling that dissipates internal heat while providing noise-free operation. The 2U rackmount computer has the Intel Penryn Core 2 Duo mobile processor, and its 3.5-inch-high steel chassis deploys into standard 19-inch EIA rack cabinets. I/O connectivity of the SR-2625F includes: Gigabit LAN, 8-USB 2.0, 1-Serial, 1-eSATA 1-DVI, 1-HDMI, and Audio 7.1 ports with optional Wi-Fi 802.11g. Each system supports as much as 4 gigabytes of memory and has a built-in, 2.5-inch, high-shock hard

drive with as much as 500 gigabytes of storage space for archived data. Solid-state hard drives are available. Systems are compatible with Microsoft Windows 7/Vista/XP and Linux. For more information, visit Stealth Computer online at www.stealth.com.

» EMBEDDED COMPUTING

MEN Micro announces support for PICMG 2.30 CompactPCI PlusIO specification

MEN Micro Inc. in Ambler, Pa., announced support for the PICMG 2.30 specification, CompactPCI PlusIO. This new specification adds PCI Express, Ethernet, SATA, SAS, and USB extensions to the CompactPCI family of specifications, while preserving PCI bus connectivity, MEN Micro officials say. The specification defines the use of previously reserved rear I/O pins for the 64-bit CompactPCI



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NEW PRODUCTS

system slot with new high-speed serial signals to preserve interoperability with existing CompactPCI standards. MEN Micro's technical director and head of the PICMG working group, Manfred Schmitz, says "developments such as the PICMG 2.30 specification enable the large community of existing CompactPCI users to retain their initial investments, while upgrading their systems to perform in accordance with evolving market needs." CompactPCI was initially ratified as PICMG 2.0 in 1995. As a passive backplane system based on PCI signaling, it defined compute and peripheral nodes using 3U and 6U Eurocard form factors. Over the 14 year history of CompactPCI, PICMG has added subsidiary specifications to enhance functionality, and PICMG 2.30 represents the latest addition of these specifications. For additional information, visit www.menmicro.com/products/about-compactpci-serial.

» EMBEDDED COMPUTING

6U VME computer boards with PowerQUICC III introduced by Extreme Engineering Solutions

Extreme Engineering Solutions (X-ES) in Middleton, Wis., is introducing the XCalibur1531 6U VME computer board with Freescale Semiconductor's dual-core MPC8572E PowerQUICC III processor for compute-intensive, embedded computer applications. The computer boards are for military embedded computing applications, as well as for industrial embedded applications. Features of the XCalibur1531 single-board computer include two channels of as much as 4 gigabytes of DDR2-800 SDRAM with ECC; as much as 16 gigabytes of NAND flash and 256 megabytes of NOR flash; SATA 3.0; three USB 2.0 ports; two PrPMC/XMC interfaces;



Green Hills Integrity board support package (BSP); Wind River VxWorks BSP; QNX Neutrino BSP; and Linux BSP. For more information, visit X-ES online at www.xes-inc.com.

» BATTERY POWER

Falcon Electric unveils lightweight lithium-polymer battery pack for mobile military applications

Falcon Electric Inc. in Irwindale, Calif., has unveiled a new lightweight, power-conversion system and ultra-light lithium-polymer battery pack. Falcon's ED LIB Series 5kVA UPS includes a Lithium-Polymer battery system which is the first Department of Transportation (DOT)-certified battery for use on-board Mobile Armored Vehicle (MAV), High-Mobility Multipurpose Wheeled Vehicle (HMMWV), and other mobile applications. Falcon's power-conversion system converts the three-phase, 400Hz power provided by an Auxiliary Power Unit (APU) in the vehicle and converts this raw alternate power to a clean, regulated 120VAC/60Hz source for critical computer and communications gear on board. Hundreds of the new rackmount ED-LIB Series 5kVA models are in use by the U.S. Army in Iraq and Afghanistan. With its light weight and small size, the ED-LIB is a solution for powering sensitive computer-based equipment from generator-based APU sources typically incorporated into single and dual-pallet shelters, as well as tactical, hospital, or laboratory shelters. To accommodate mobile applications, the ED-LIB is designed to meet the shock and vibration requirements of RTCA/DO160, Zone A, and the Munson Road Test. For more information, visit Falcon Electric online at www.falconups.com.

» DIGITAL SIGNAL PROCESSING

Blackfin digital signal processor introduced by Analog Devices

Analog Devices Inc. in Norwood, Mass., is introducing the Blackfin BF50x digital signal processor (DSP) chips with integrated analog-to-digital converters (A/D converters) and flash

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memory for converged digital signal and control processing applications such as power inverters, uninterruptible power supplies (UPS), servo controls, and motor controls. The new DSP chip enables designers to apply advanced power control techniques to yield greater energy efficiency. The 400 MHz Blackfin BF50x processors can extend high-performance digital signal processing capabilities to a wider range of applications, including those previously serviced by high-end microcontrollers, Analog Devices officials say. Blackfin BF50x processors combine industry-standard interfaces with a signal processing core without the need for external components. With optional integrated dual-SAR 12-bit A/D converters and 4 megabytes of on-board executable flash memory, Blackfin BF50x processors keep off-chip components to a minimum. For more information, visit Analog Devices online at www.analog.com.

» DATA BUSES AND NETWORKING

Hybricon announces the availability of standard VITA 65 VPX backplanes

Hybricon Corp. in Ayer, Mass., introduced standard VITA 65-compliant VPX backplanes—compatible and interchangeable with Hybricon's air-cooled development chassis families. Hybricon's standard VITA 65 VPX backplanes support OpenVPX, VPX, and VPX RED; support ANSI/VITA 46.0, ANSI/VITA 65, VITA 46.3, VITA 46.4, VITA 46.7, and VITA 46.11 draft standards; support VITA 48.0, VITA 48.1 and VITA 48.2 draft standards; support VITA 65 OpenVPX backplane configurations; are applicable for both Air Cooled VITA 48.1 and Conduction Cooled VITA 48.2 applications; are designed to meet environmental requirements per ANSI/VITA 47 class ECC4 (requires optional conformal coating to meet requirements such as humidity, salt, and fog); and have an operating temperature range of -40 to 85 degrees Celsius at MSL. For more information on Hybricon products, visit www.hybricon.com.



» TRANSIT CASES

Rugged transit rack cases from Optima EPS protect electronics

Optima EPS in Lawrenceville, Ga., is introducing E-TR transit rack cases in 4U and 12U heights for transporting electronic systems in extreme environments. E-TR transit rack cases comply with MIL-STD 810F, are rated to IP65, and are stable in temperatures from -40 to 158 degrees Fahrenheit. The rotomolded cases have stainless-steel, 19-inch rack frames supported on anti-vibration mounts. Enhanced sway space between the inner frame and outer case prevent contact with container shell, whereas the adjustable inner frame increases depth for front panel, rear wiring, or connector spacing. The racks have positive stacking, aligning flush at the front, ergonomic injection-molded carrying handles, and optional cooling units. For more information, visit Optima EPS online at www.optimaeps.com.

» EMBEDDED COMPUTING

MEN Micro 3U CompactPCI embedded computer boasts Intel Atom and onboard FPGA

MEN Micro Inc. in Ambler, Pa., is introducing a 3U CompactPCI single-



board computer called the F11S that combines the Intel Atom XL processor with an onboard FPGA for user-defined functions. The rugged F11S computer board is for embedded computing in harsh environments in aerospace, defense, transportation, and industrial applications. The CPU board can be equipped with various 45-nanometer Intel Atom XL processors, which offer a maximum power dissipation of 7 watts at speeds as fast as 1.6 GHz. The board's heat sink enables operation across an extended temperature range of -40 to 85 degrees Celsius. The rugged board's standard front I/O includes a COM interface via a D-Sub connector, as well as two USB 2.0 ports, graphics via VGA or UXGA, and a PS/2 interface for a keyboard or a mouse. Further interfaces include a Gigabit Ethernet slot via PCI Express x1 and an FPGA-based Fast Ethernet slot on the RJ45 connectors. The onboard FPGA also allows for serial interfaces, CAN bus, binary I/O, protocol converters, or touch controllers. The F11S can accommodate as many as three SA-Adapters for additional I/O. The card occupies two or three system slots. For more information, visit MEN Micro online at www.men.de.

» EMBEDDED COMPUTING

Intel Atom-based rugged computer remote-control unit from Aitech dissipates 22 watts of heat

Aitech Defense Systems Inc. in Chatsworth, Calif., is introducing its latest version of the NightHawk RCU, an Intel Atom-based rugged computer remote-control unit for unmanned vehicles, armored vehicles, and aircraft. The NightHawk RCU weighs 4.5 pounds, has a slimmer profile than its predecessors, and offers natural radiation and convection cooling that dissipates heat from as much as 22 watts at 55 degrees Celsius in non-flowing air, or at temperatures as high as 71 C with an optional low-pressure fan or baseplate. Based on the low-power Intel Atom processor operating

NEW PRODUCTS



at 1.6 GHz, the NightHawk provides as much as 2 gigabytes of DDR2 SDRAM memory, as well as between four and eight gigabytes of solid-state drive memory. An optional expansion delivers as much as 250 gigabytes of solid-state disk memory for extended and remote data collection and data storage applications. For military tracked and wheeled vehicle applications, the NightHawk RCU can provide condition-based maintenance (CBM) to reduce the overhead costs of preventative vehicle maintenance. For more information, visit Aitech online at www.rugged.com.

» DATA BUSES AND NETWORKING

MIL-STD-1553 avionics data bus interface from National Hybrid supports MIL-STD-1760

National Hybrid Inc. in Ronkonkoma, N.Y., is introducing the Terminal+ multi-protocol MIL-STD-1553 avionics data bus interface with integrated transformers, which can function as a simultaneous monitor/remote terminal, a programmable bus controller, a remote terminal, or a bus monitor. The Terminal+ ensures the integrity of data and control structures, and its integrated transformers occupy minimal board space and simplify circuit board layout. The avionics databus component serves as an interface between a dual redundant bus and a host processor, and supports MIL-STD-1553 and MIL-STD-1760 functionality in one low-power unit. The subsystem interface can be a local bus or a PCI bus. The Terminal+ interfaces with all popular processors and buses, because no external logic is required. The Terminal+ features a protocol

ASIC, which controls the multi-protocol functions, two 5- or 3.3-volt monolithic transceivers, and a 64k x 16 shared RAM. All logic I/O is 3.3 volts that is 5-volt tolerant. The only external component required is a 20 MHz clock. The open memory

architecture increases design flexibility and reduces software development time and effort. For more information, visit National Hybrid online at www.nationalhybrid.com. National Hybrid is owned by API Technologies Corp. in Ronkonkoma, N.Y.



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» NEW PRODUCTS


» EMBEDDED COMPUTING

Rugged, Intel Atom-based PC/104-plus, single-board computer introduced by Advantech America

Advantech America in Milpitas, Calif., is introducing its Intel Atom-based PCM-3362 industrial-grade, PC/104-plus CPU board. The new product offering is designed for outdoor integration in military, transportation, and space-saving embedded applications. The PCM-3362 single-



board computer features a low-power design, as many as four USB 2.0 ports, and three COM ports integrated into a standard 96-by-90-millimeter form factor. The compact embedded computer supports dual display for LVDS and CRT. Advantech America's single-board computer operates in temperatures from -40 to 85 degrees Celsius and resists the effects of vibration, according to company officials. The system's use of the Intel Atom processor produces a thermal design power (TDP) rating of less than 5.5 watts, lending to space-efficient solutions with power-saving features for mil-aero environments. The graphics and memory controller hub runs at

1.66 GHz, and is on the same chip as the CPU. The rugged and vibration-resistant board has a PC/104-plus connector, 2 gigabytes of on-board Flash memory, two RS-232 serial ports, one RS-422/485 serial port, four USB ports, one SATA interface, an I2C connector, and 8-bit GPIO. A 10/100/1000-megabit-per-second Ethernet port is also available for high-speed networking applications. The Intel Gen 3.5 integrated graphic core uses as much as 224 megabytes of shared memory. VGA and LVDS dual video outputs are included. For additional information about the new single-board computer, visit Advantech America online at www.advantech.com. 

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GO MILAERO BLOG

Does the Green Lantern read Military & Aerospace Electronics?

I know that *Military & Aerospace Electronics* is read by influential figures in and out of the aerospace and defense industry, but I never realized that our magazine also is the journal of choice for at least one superhero. It seems the Green Lantern, a test pilot who is granted a mystical green ring bestowing him with otherworldly powers, as well as membership in an intergalactic squadron tasked with keeping peace within the universe, also is among our subscribers.

Hey, don't look at me; I was as surprised as you. Here's the deal: a summer action movie blockbuster is scheduled for release in June 2011, tentatively entitled *The Green Lantern*, that will have a plot along the lines of other recent movie releases that are based on comic book characters from DC comics, Marvel, and others. This time, *Military & Aerospace Electronics* might have a bit part in the movie.

Production has begun on the film and set designers have asked for issues of the magazine. It's possible that issues of *Military & Aerospace Electronics* will be part of airport scenes in the movie.

more  <http://bit.ly/9vDLEQ>

DEFENSE EXECUTIVE

Air Force speeds optical interconnect development

U.S. Air Force researchers are asking industry to improve photonics interconnect manufacturing technology to hasten the future use of optical interconnects for chip-to-chip, board-to-board, and system-to-system high-speed optical computing.

The Air Force Research Laboratory at Wright-Patterson Air Force Base, Ohio, released a broad agency announcement (BAA-10-10-PKM) for the \$2.4 million Photonics Manufacturing Program to find ways to cut costs, speed development, and increase availability of photonics interconnect technology for military applications. The goal is to hasten the maturity of optical interconnect technology so Air Force leaders can introduce it quickly in their inventory of weapons. Funding for the three-year program should be \$400,000 in 2010, \$1 million in 2011, and \$1 million in 2012.

more  <http://bit.ly/bwkDRR>

AVIONICS INTELLIGENCE

General Dynamics to provide Navy avionics computers

Avionics experts at General Dynamics Advanced Information Systems in Bloomington, Minn., will provide the U.S. Navy with 118 type-3 advanced mission computers for carrier-based F/A-18 and E/A-18G jet fighter-bomber and electronic warfare aircraft under terms of a \$30.6 million contract.



The advanced mission computer avionics processor can be configured to meet the general purpose, I/O, video, voice, and graphics processing needs of military aircraft avionics.

Built on an open-systems architecture to enable rapid insertion of emerging technologies, the advanced mission computer uses commercial off-the-shelf (COTS) technology to provide high-performance computing for laboratory use or in harsh-environment avionics, ground-based, and shipboard applications.

more  <http://bit.ly/9zSQw9>

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